

Pajaro River Watershed IRWM Implementation Proposal Technical Justification of Projects

Introduction

The Pajaro River Watershed IRWM Implementation Proposal includes four of the highest priority projects designed to address the most significant water supply and water quality needs in the region. This attachment presents a brief overview of the region's water supply and water quality needs and demographics, followed by a discussion of how the projects work together to address the region's needs. The remainder of the attachment is focused on the detailed documentation and technical justification for each of the projects. The attachment outline is presented below:

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7.1 Region Description

The Pajaro River Watershed IRWM regional boundary is the Pajaro River Watershed boundary, as illustrated in Figure 7.1. The Watershed is an appropriate area for integrated regional water management because of the mutual needs and shared resources that link the region. The Pajaro River is the largest coastal stream between San Francisco Bay and the Salinas River Watershed in the County of Monterey. The watershed is approximately 1,300 square miles and it includes portions of Santa Cruz, Santa Clara, San Benito, and Monterey Counties. Its large size contributes to the number of diverse environments, physical features, and land uses within the watershed. Tributaries to the Pajaro River, the largest of which is the San Benito River, serve as the major routes for surface flow and drainage throughout the watershed.

Major water resource agencies within the Pajaro River Watershed IRWM region include Pajaro Valley Water Management Agency (PVWMA), San Benito County Water District (SBCWD) and Santa Clara Valley Water District (SCVWD), which have a number of common linkages, interests, and goals including water supply reliability, groundwater management, recycled water, water quality protection, flood protection, and environmental resource management. Figure 7.2 illustrates the agencies' jurisdiction in relation to the Pajaro River watershed. Runoff from this watershed collects and drains to the Pajaro River and ultimately to Monterey Bay. SBCWD and SCVWD service areas encompass the major tributaries to the Pajaro River and form the upper portion of the watershed. The PVWMA service area, which lies at the mouth of the watershed, forms the lower portion of the watershed.

In the Pajaro River watershed, the SCVWD and SBCWD share an interconnected groundwater basin. This groundwater basin connection is a linkage between the two agencies in regards to groundwater management activities. The Pajaro River groundwater basin is bound by the San Andreas Fault to the east, which separates the Pajaro Basin from the SCVWD and SBCWD groundwater basin. However, the Pajaro Groundwater Basin is influenced by the Pajaro River, which drains South SCVWD and SBCWD service areas. Therefore, drainage activities within the SCVWD and SBCWD service areas influence groundwater in the PVWMA service area.

In addition, SBCWD and SCVWD are existing CVP water contractors that are supplied by the San Felipe Unit facilities at San Luis Reservoir. These linkages provide the unique opportunity to develop various regional projects in the Pajaro River watershed to meet multiple goals and objectives of the three agencies and stakeholders.

The highest priority need in the Pajaro River Watershed, as defined and prioritized in the IRWM Plan, is providing a safe and reliable water supply for all stakeholders in the watershed but notably for the Disadvantaged Community (DAC) of Pajaro. A detailed discussion of this need and how the projects meet this need is provided below.

Figure 7.1: Pajaro River Watershed IRWM Regional Boundary

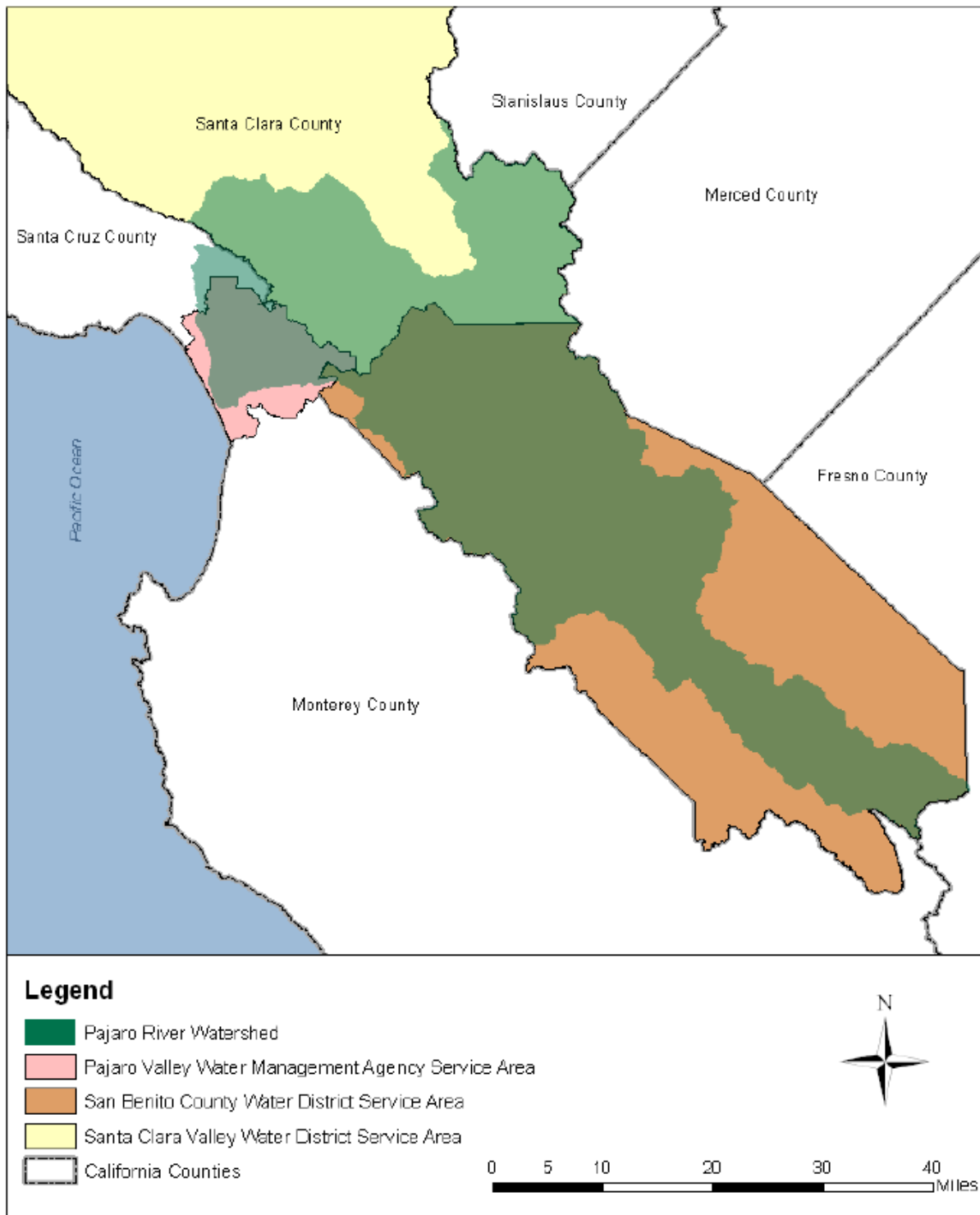
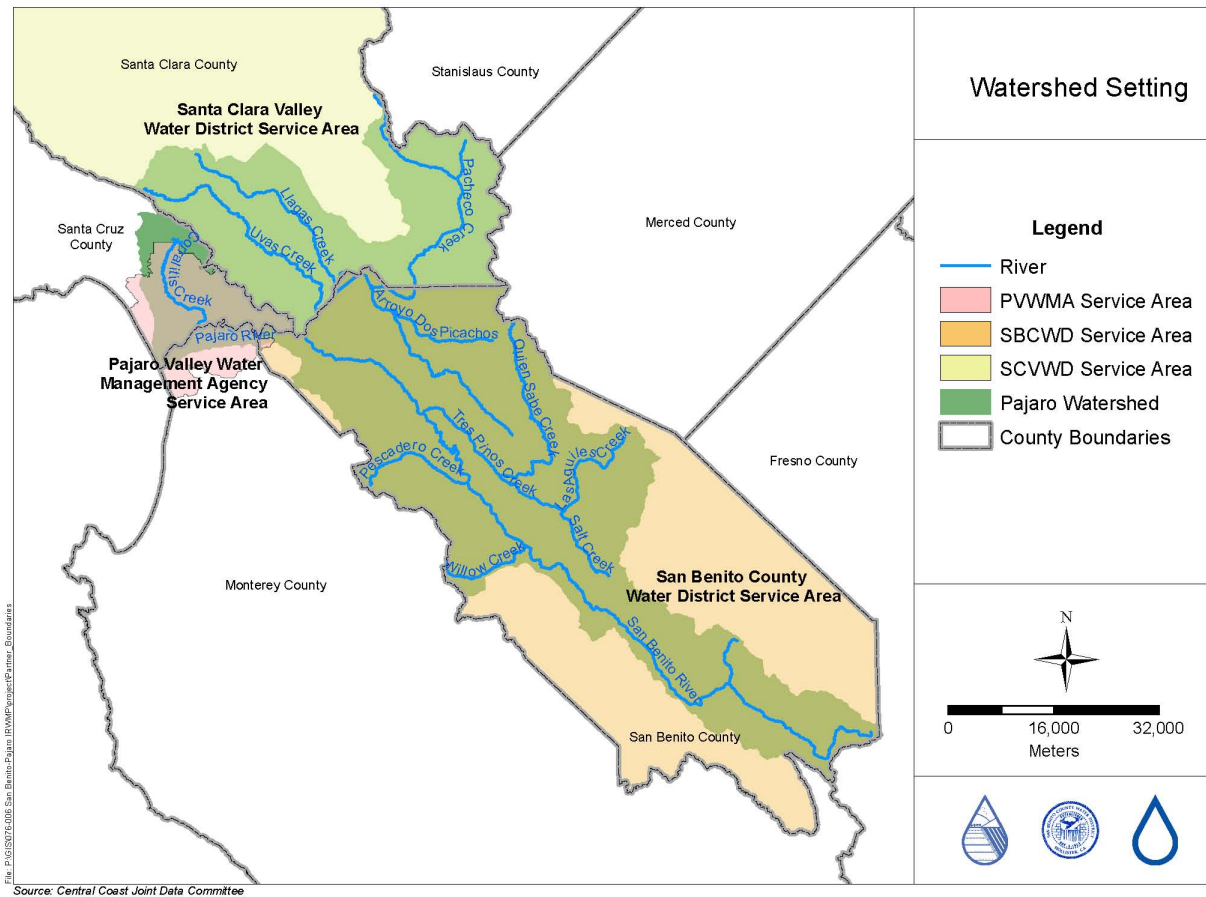


Figure 7.2: Watershed Setting



7.1.1 Water Quantity and Quality

The region's water supplies consist of groundwater, local surface water, import surface water from the CVP, and recycled water. Major water supply and quality issues in the watershed include:

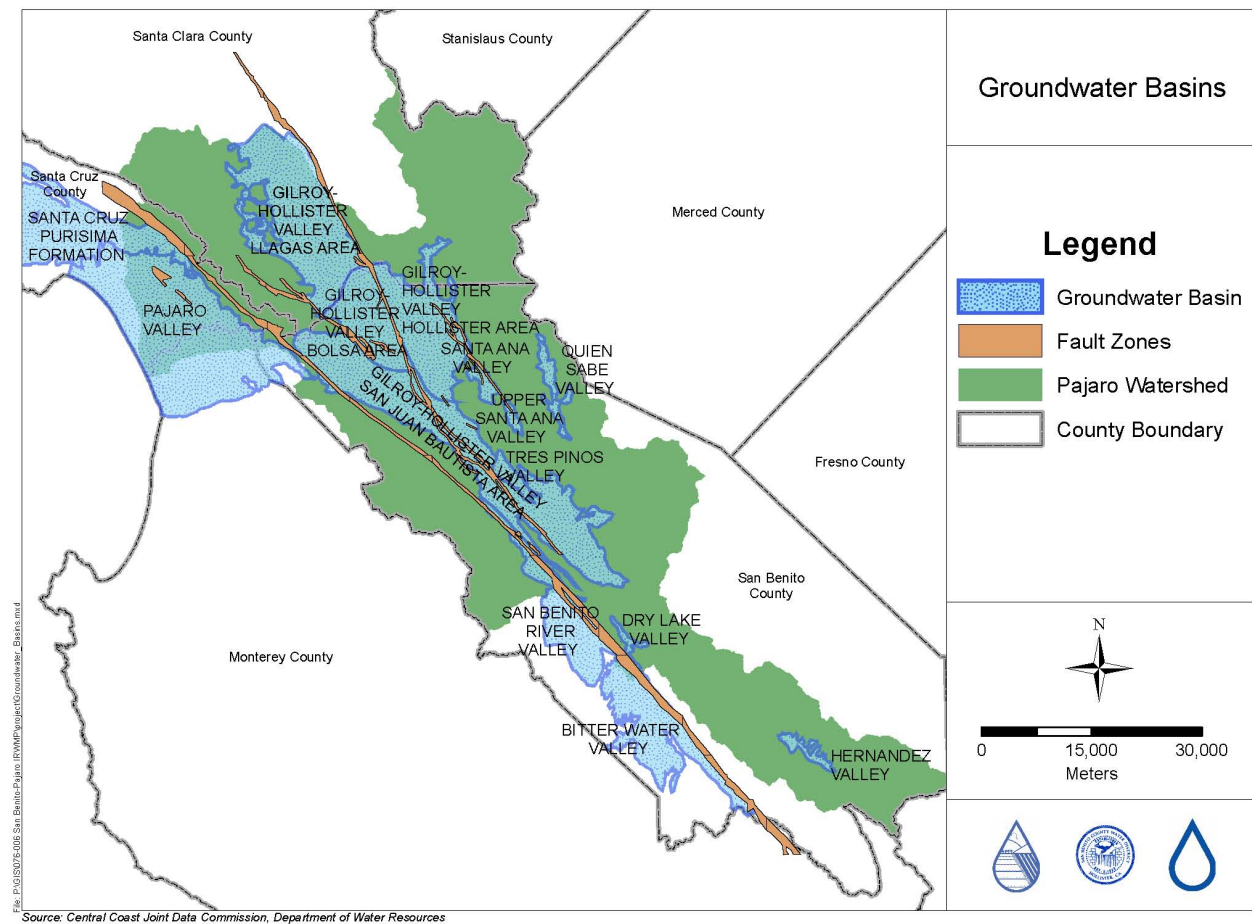
- Pajaro Valley Groundwater Basin overdraft;
- San Felipe Division Water supply reliability;
- Salinity and hardness in San Benito County groundwater; and
- Sediment and Nutrient in surface water.

The HUA Water Project, Increased Recycled Water Storage Project, and Pajaro Agricultural Water Quality and Aquifer Enhancement Project (included in this proposal) are designed to address these critical water supply and quality issues.

Groundwater Supply

Groundwater is the major water supply in the Pajaro River watershed. The PVWMA, SBCWD, and SCVWD are responsible for management of various groundwater basins in the Pajaro River watershed. Figure 7.3 shows the groundwater basins in the watershed in relation to county boundaries and fault lines.

Figure 7.3: Groundwater Basins within the Pajaro River Watershed Region



Groundwater basin characteristics of importance include water quality, supply sustainability, land subsidence, and liquefaction. The quality and sustainability of groundwater varies throughout the watershed and is dependent on management activities and local practices.

The Pajaro Valley Groundwater Basin, which is separated from the rest of the watershed's groundwater basins by the San Andreas Fault, is affected by overdraft and seawater intrusion that are impacting the quality of groundwater. Another significant Pajaro Valley groundwater quality concern is nutrients and other contaminants from agricultural practices. The Pajaro Valley Groundwater Basin is influenced by the Pajaro River, which drains the upper portion of the watershed including the SCVWD and SBCWD jurisdictional areas. Therefore, collaboration by the stakeholders in the region is critical for managing the groundwater basin. The Increased Recycled Water Storage Project and Pajaro Agricultural Water Quality and Aquifer Enhancement Project (included in this proposal) are designed to better utilize local water supplies, off-set groundwater pumping, and protect the beneficial use of the groundwater basin.

The major groundwater basin that underlies the SCVWD and SBCWD portions of the watershed is the Gilroy-Hollister Valley Groundwater Basin, which can be further subdivided into the Llagas, Bolsa, San Juan Bautista and Hollister sub-basins. Portions of the Gilroy-Hollister Valley Groundwater Basin are subject to high groundwater levels; over the past few years, the groundwater table has approached or reached the land surface at several locations creating nuisance problems for existing land uses. Portions of this basin are also affected by high salinity levels and nutrients, which can impact the beneficial use of groundwater. The HUA Water Project (included in this proposal) is designed to address salinity issues in the basin, protect the beneficial use of the groundwater basin, and better utilize local water supplies.

Recycled Water

One of the primary recycled water facilities in the Watershed is the Watsonville Area Water Recycling Project (WAWRP). The WAWRP was implemented by PVWMA and the City of Watsonville as part of PVWMA'S long-term plan to halt seawater intrusion. The project is fully operational with recycled water deliveries beginning in April 2009. The recycled water facility is designed to produce approximately 4,000 AFY of recycled water to be blended with 2,000 AFY of "blend" water, for a total of 6,000 AFY of water for agricultural customers along the Pajaro Valley coast. The WAWRP assists in balancing the Pajaro Valley Groundwater Basin and provides sustainable supply for the PVWMA service area. However, enhancement to the project are required to realize the full available yield. The Increased Recycled Water Storage Project is designed to better utilize the recycled water local supply, and further off-set groundwater pumping, and protect the beneficial use of the groundwater basin.

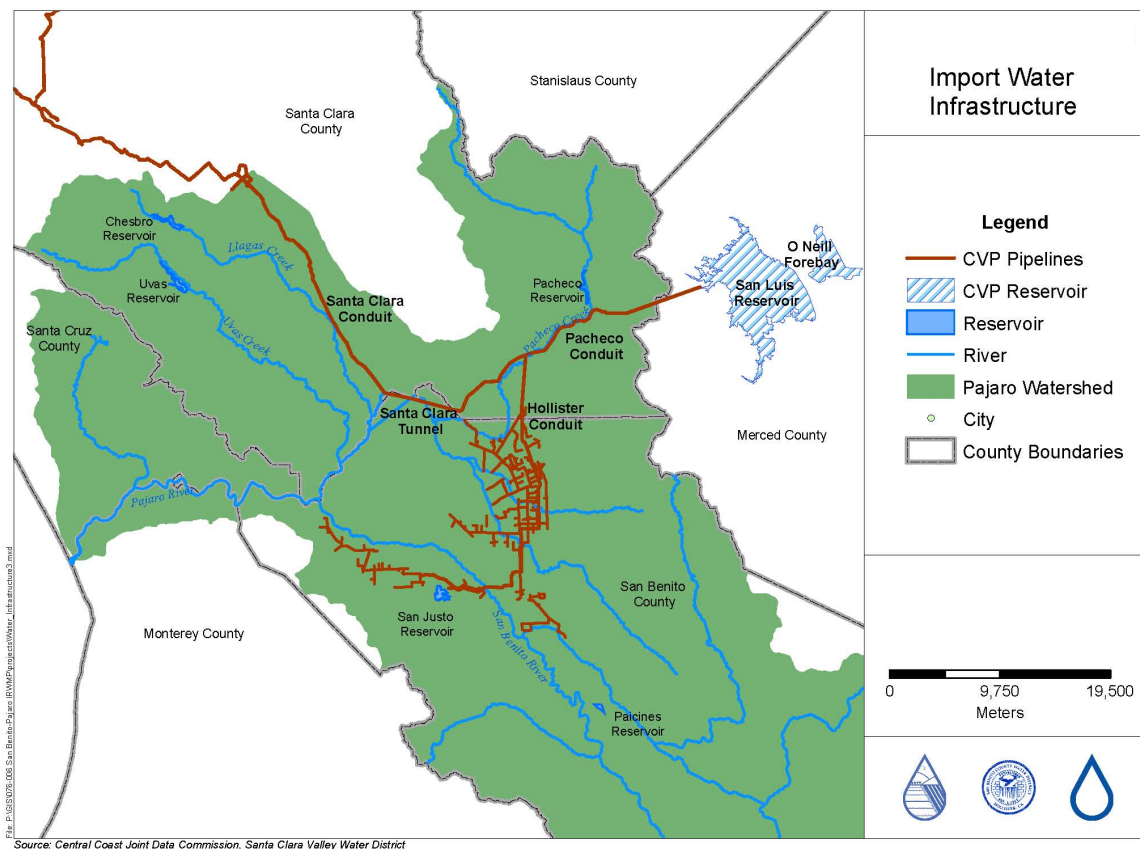
A second recycled water project in the watershed is the City of Hollister Water Reclamation Facility that was constructed in 2009. Unfortunately, the TDS levels in the recycled water are greater than 1,100 mg/L and can not be beneficially used for agricultural irrigation. The recycled water is currently percolated or disposed of with with sprayfield irrigation. The HUA Water Project is designed to reduce the TDS levels in the wastewater, leading to a reduction in the TDS

of the recycled water, allowing the recycled water to be beneficially used or agricultural irrigation.

Import Water Supply

Import water supply from the CVP is delivered to the Pajaro River Watershed through the San Felipe Unit, which supplies water from San Luis Reservoir. Major infrastructure for the San Felipe Unit also includes the Pacheco Pumping Plant, Pacheco Conduit, Santa Clara Conduit, and Hollister Conduit. The SBCWD operates San Justo Reservoir (owned by the USBR) which is used as operational storage for the San Benito CVP water system. The SCVWD and SBCWD, are CVP water contractors. Figure 7.4 shows the import water infrastructure located throughout the Pajaro River watershed.

Figure 7.4: Import Water Infrastructure



The San Felipe Unit currently provides supply for agricultural and M&I designations in SCVWD and SBCWD service areas. CVP water is served directly for agriculture and irrigation, and is treated and served for M&I use. The long-term average annual available CVP supply for agriculture (2020 LOD) is estimated to be 53% of the contracted entitlement. The long-term average annual M&I available supply (2020 LOD) is estimated to be 83% of the contracted entitlement. The HUA Water Project is designed to provide the capacity necessary to treat the CVP supplies, allowing SBCWD to conjunctively manage CVP and groundwater supplies to deliver a reliable supply in wet and dry years.

Water Quality

The SWRCB has identified the Pajaro River Watershed as having significant water quality impairment for failing to meet beneficial uses, including municipal, agricultural, and industrial water supply, ground water recharge, support of rare, threatened or endangered species, migration and spawning of aquatic organisms, and preservation of wildlife habitat, biological habitats of special significance, cold and warm freshwater habitat, as well as estuarine ecosystems. The Pajaro River, along with several of its tributary streams, are now listed on the RWQCB prioritized Clean Water Act (CWA) Section 303(d) list of impaired water bodies for nutrient, sediment, and pesticide pollution.

The California Regional Water Quality Control Board Central Coast Region adopted Order No. R3-2012-0011 (Conditional Waiver of Waste Discharge for Discharges from Irrigated Lands). This order regulates discharges of “waste” as defined in the Water Code section 13050 and “pollutants” as defined in the Clean Water Act from irrigated lands by requiring individuals subject to the order to comply with conditions to ensure that such discharges do not cause or contribute to the exceedance to and Regional, State, or Federal numeric or narrative water quality standard in the waters of the State and of the United States.

The Order requires compliance with water quality standards. Dischargers must implement, and where appropriate update or improve, management practices, which may include local or regional control or treatment practices and changes in farming practices to effectively control discharges, meet water quality standards and achieve compliance with this Order. Consistent with the Water Board’s Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program (NPS Policy, 2004), dischargers comply by implementing and improving management practices and complying with the other conditions, including monitoring and reporting requirements. The Order requires the discharger to address impacts to water quality by evaluating the effectiveness of management practices (e.g., waste discharge treatment and control measures), and taking action to improve management practices to reduce discharges. If the discharger fails to address impacts to water quality by taking the actions required by the Order, including evaluating the effectiveness of their management practices and improving as needed, the discharger may then be subject to progressive enforcement and possible monetary liability.

On March 20, 2009 the California Regional Water Quality Control Board amending the water quality control plan for the central coast basin to (1) add total maximum daily loads for fecal

coliform in the Pajaro River Watershed (including Pajaro River, San Benito River, Llagas Creek, Tequisquita Slough, San Juan Creek, Carnadero/Uvas Creek, Bird Creek, Pescadero Creek, Tres Pinos Creek, Furlong (Jones) Creek, Santa Ana Creek, and Pacheco Creek); (2) Add a domestic animal Waste Discharge prohibition; and (3) add a human fecal material discharge prohibition.

The aspects of agriculture that potentially impact water quality include erosion and sedimentation, offsite transport of chemical fertilizers and pesticides, and microbial contamination. Storm water, flooding, irrigation, and leaching can all mobilize substances that are beneficial while on-site, but become pollutants as they concentrate in neighboring streams, rivers, wetlands, and nearshore waters. Though each individual farm or ranch may contribute a relatively small amount of pollutants, the cumulative effects through the length of a watershed can be damaging. At the same time, the offsite movement of sediments, pesticides and nutrients can represent a long-term economic loss to the grower.

The Pajaro Agricultural Water Quality and Aquifer Enhancement Project (included in this proposal) is designed to work with farmers, ranchers and forest landowners to adopted a variety of management measures to reduce polluted runoff. Expanding and strengthening the conservation practices already begun by the landowners can help protect the beneficial use of water resources and sustain the long-term economic viability of agriculture in the Pajaro River Watershed.

7.1.2 Region Demographics and Disadvantaged Communities

The Pajaro River watershed social setting is rooted in the urban communities that can generally be classified as suburban and rural in character. The economic setting in the Pajaro River watershed can generally be characterized as agriculturally based. Agricultural production and processing are the major industries throughout the watershed.

San Benito County agriculture is a \$255 million industry (San Benito County 2010 Annual Crop Report). The County's farming and grazing lands are extremely productive and support a significant acreage and variety of crops. Some of the most common vegetable crops grown in the County include lettuce, bell peppers, onions, celery, and broccoli. Common orchard crops are walnuts, grapes, apricots, and apples. The City of Hollister is the major urban area in the County and is generally considered a suburban type community. The economy is based on agricultural production and processing.

Agriculture is the cornerstone of the Pajaro Valley economy and is an \$800 million industry. Without development of a sustainable water supply, an estimated 25,660 acres of agricultural land would need to be fallowed to reduce groundwater pumping to eliminate seawater intrusion and the groundwater overdraft. The lost agricultural production would result in loss of approximately 11,530 jobs (USBR, August 2003). Property values would also likely plummet as land would likely be converted to range land. The City of Watsonville is the major urban area in the Pajaro Valley and can be generally classified as a suburban community. The City's economy is linked to the agricultural production of the region and would be impacted by losses in agricultural production.

A disadvantaged community (DAC) is defined in the California Public Resource Code as a community with an annual median household income (MHI) that is less than 80% of the statewide MHI [PRC §75005 (g)]. 2010 Census data were collected and reviewed to identify any DACs in the region. The 2010 State MHI was \$60,883; therefore, communities with an average MHI of \$48,706 are considered disadvantage communities. The MHIs of four cities in the Pajaro River watershed are less than 80% of the State MHI, Pajaro, Watsonville, Amesti, and Freedom. In addition to the relatively low per capita income as compared to the statewide average, the cost of living in these areas is relatively high compared to the Statewide average, resulting in an increase in the average household sizes in these cities above the state average. The Critical Water Supply System Improvement for Pajaro Project (included in this proposal) is designed to address the critical water needs of the DAC Pajaro.

7.2 Project 1 Hollister Urban Area Water Project

The Hollister Urban Area (HUA) is located in San Benito County, California, approximately 50 miles southeast of the City of San Jose and 40 miles east of Monterey Bay as shown in Figure 7.5. The Hollister Urban Area includes the City of Hollister (City) and adjacent unincorporated areas of San Benito County designated for urban development.

Due to its unique climate, fertile soils, and water supplies, agriculture is the county's largest industry. According to the county Agricultural Commissioner's Annual Report for 2007, the gross value of agricultural production was over \$293 million. The top five crops in 2007 were lettuce (salad), nursery stock, miscellaneous vegetable and row crops, grapes (wine), and bell peppers.

According to the City of Hollister General Plan (December, 2005), San Benito County was the fastest growing county in California during the 1990s, with the majority of that growth concentrated in the City of Hollister. With the proximity of the City of San Jose and Silicon Valley, the area is increasingly becoming a bedroom community for commuters. Currently, approximately one-half of residents commute to areas outside San Benito County.

Northern San Benito County has a diverse and complex water supply composed of imported surface water from the Central Valley Project (CVP), a substantial groundwater basin, numerous river and creek channels for groundwater recharge, and significant opportunities for water recycling.

7.2.1 Project Need

The HUA Project is needed to:

- Improve water quality to meet existing Waste Discharge Requirements (WDRs);
- Provide a high quality potable water supply to meet current and projected demands; and
- Improve water quality to allow for the beneficial use of recycled water.

Hardness and total dissolved solids (TDS) are the key constituents in the existing municipal water supply, which are driving the Project Need. Municipal supplies in the HUA are served by a blend of local groundwater and imported Central Valley Project (CVP) water, which is treated at the Lessalt Water Treatment Plant (Lessalt WTP). The groundwater supply has very high hardness and TDS concentrations. As a result, many residential customers use water softeners to remove the hardness from their potable supply. Unfortunately, water softeners introduce a byproduct (brine stream) with additional TDS to the wastewater. In the HUA, wastewater is treated at two wastewater treatment plants; however, TDS is not removed in the wastewater treatment process. The treated effluent is then disposed of through existing percolation ponds which introduce the high TDS concentrations back to the groundwater supply. Over time, this cycle has degraded the quality of the groundwater supply raising concerns from the Central Coast Regional Water Quality Control Board (RWQCB) and leading them to issue WDRs for both wastewater treatment plants to reduce the TDS concentration in their respective treated wastewater effluent.

Figure 7.5 HUA Location Map and Study Area



Rather than add expensive treatment processes to the wastewater treatment to meet WDRs, an analysis conducted as part of the Hollister Urban Area Water and Wastewater Master Plan, November 2008 (Exhibit 7.1). Appendix E of the Master Plan – Technical Memorandum on Demineralization (Exhibit 7.2), showed that the best way to break the cycle is to improve the potable water quality and eliminate the need for water softeners, thus leading to reduced TDS levels in the wastewater and treated effluent.

In addition to the hardness and TDS quality concerns described above, the Lessalt Water Treatment Plant requires upgrades to meet the Stage 2 Disinfection Byproducts Rule (Stage 2 DBP Rule). The Lessalt WTP treats imported CVP water and was constructed prior to the promulgation of the Stage 2 DBP Rule. Without the proposed upgrades, the Lessalt WTP cannot remain in operation.

In addition to needing to improve water quality to meet the WDRs, the region needs to provide a reliable water supply to meet projected demands. As further described below, current and projected demands can be met by the existing supplies in normal (non-drought) conditions. However, in critically dry years, municipal supplies may be reduced to approximately 60 percent of contract entitlements and in multiple dry year conditions, up to 50 percent (Hollister Urban Area Water and Wastewater Master Plan (Master Plan, Page 1-7). Therefore, a long-term plan is required for a reliable water supply to meet the projected growth defined by the City of Hollister and San Benito County General Plans.

A potential source of supply for the HUA to meet projected demands is recycled water. The City of Hollister constructed the Water Reclamation Facility in 2009. However, due to TDS levels greater than 1,100 mg/L, the recycled water can not be beneficially used for agricultural irrigation and is currently percolated or disposed of with sprayfield irrigation. A reduction in the TDS of the potable water supply will also result in a reduction in the TDS of the recycled water. The recycled water TDS concentration needs to be 700 to 800 mg/L as an upper limit for irrigation of high value agricultural crops and to contribute to a reliable supply for the HUA.

Thus, an integrated project was needed to meet multiple water quality and water supply needs. In 2004, the San Benito County Water District (SBCWD), the City of Hollister, and San Benito County, executed a Memorandum of Understanding in 2004, (Exhibit 7.3) committing to the development of a plan that regionally, and comprehensively addresses wastewater discharge requirements, water quality, and water supply reliability for the HUA. The MOU was subsequently amended in 2008 (Exhibit 7.4) to include another responsible agency, the Sunnyslope County Water District (SSCWD). In 2011, all parties executed a Statement of Intent committing to proceed with critical project activities, including the Lessalt Water Treatment Plant environmental review and final design, the West Hills Water Treatment Plant environmental review, and operational modeling of the North County Groundwater Bank (Exhibit 7.5).

The MOU described the principles, objectives, and assumptions that ultimately formed the institutional framework and basis of the Master Plan (Exhibit 7.1). The Master Plan, focused on the following goals to meet the HUA needs:

- Improve municipal, industrial, and recycled water quality
- Increase the reliability of the water supply
- Coordinate infrastructure improvements for water and wastewater systems
- Implement goals of the Groundwater Management Plan
- Integrate recommendations of the Long-term Wastewater Management Plans (LTWMP) with the Master Plan
- Support economic growth and development consistent with the City of Hollister and San Benito County General Plans and Policies
- Consider regional issues and solutions

These needs are described in detail below.

Wastewater Discharge Requirements

Since 2002, wastewater treatment and disposal have become a constraint to development of the HUA due to a sewer growth moratorium. Treated wastewater effluent typically has TDS concentrations of approximately 1,200 mg/L at the City Wastewater Treatment Plant and up to 1,800 mg/L at the wastewater treatment plant serving the Ridgemark area of the SSCWD.

The SSCWD's Ridgemark Wastewater Treatment Plant (WWTP) serves the Ridgemark development within SSCWD's service area. The WWTP must meet its WDRs, defined in WDR Order No. R3-2004-0065, which requires a reduction in salt constituents. Specifically, the TDS concentration limit is 1,200 mg/L on a 30-day average.

Similarly, the City's Water Reclamation Facility (WRF) serves the City's wastewater collection system. The WRF must meet its requirements defined in Order No. 2008-0069, which requires a reduction in salt constituents. Specifically, the TDS concentration limit is 1,200 mg/L on a rolling 12-month basis.

The relatively high mineral content in effluent from both the WWTP and the WRF limits both disposal and recycling options due to adverse impacts to groundwater and crops.

To achieve the limits at the respective wastewater treatment plants, a project is needed to reduce the salt content in the wastewater influent to the WWTP, allowing the facilities to meet the WDRs. As previously described, it was determined that a project that improves the potable water quality will achieve this goal and provide additional water quality benefits for the potable system and enhance beneficial use opportunities of the recycled water. A target treated effluent TDS concentration of 500 mg/L (with a maximum limit of 700 mg/L) was established in the MOU to increase recycling and disposal opportunities.

Potable Water Quality

As previously described, it was determined that the most effective way to reduce the TDS levels in the treated effluent is to reduce the TDS levels in the potable water supply that are ultimately treated at the wastewater treatment plants. Improved potable water quality will also reduce or

eliminate the need for water softeners, further reducing the TDS in the wastewater and treated effluent.

Municipal supplies in the HUA are served by a blend of local groundwater and imported CVP water treated at the existing Lessalt Water Treatment Plant (WTP). Historically, TDS concentrations in groundwater range from 800 to 1,200 milligrams per liter (mg/L) and imported CVP surface water has TDS concentrations ranging from 250 to 300 mg/L (Master Plan, Page 1-6). Similarly, total hardness concentrations in the groundwater range from 250 to 480 mg/L as calcium carbonate (CaCO₃) and CVP sources have a hardness concentration of approximately 110 mg/L as CaCO₃. The current HUA water supply is composed of three quarters municipal groundwater (3.7 mgd) and one quarter treated CVP water from the existing Lessalt WTP (1.7 mgd) (Draft System Operations Technical Memorandum, December 2012) (Exhibit 7.6). This blend of water results in an average hardness of approximately 340 mg/L (very hard) and an average TDS of approximately 690 mg/L.

Although the treated water meets all primary federal and state drinking water limits, hardness and minerals introduced by the groundwater in the water supply need to be reduced to adequately meet the Federal Secondary maximum contaminant level (MCL) for TDS and to meet water quality objectives as established in a Memorandum of Understanding (MOU) by regional water and wastewater agencies (described in the Project Development and Selection section below). Additionally, the reduced TDS and hardness will reduce TDS and hardness at the wastewater treatment plants and allow for compliance with the WDRs.

The following treated water objectives were established in the MOU to provide improve water quality in the potable supply:

- TDS concentrations not greater than 500 mg/L
- Hardness not greater than 120 mg/L

TDS is usually not a health concern, but can be a taste, odor, and color concern for drinking water. The Federal Secondary MCL is 500 mg/L. At levels over 500 mg/L, TDS can cause gastrointestinal irritation to consumers not used to these levels. Excess sodium may affect those restricted to low sodium diets or those suffering from toxemia. Other concerns include scaling on sinks and fixtures, leaving white spots on cars, deposits in and corrosion of hot water heaters and pipes, and reduced effectiveness of detergent and shampoo. The buildup in water using appliances can shorten appliance life and increase costs to consumers. Preliminary estimates indicate that local groundwater supplies may reduce the life expectancy of residential appliances by up to 25 percent, as compared with a water supply having a TDS level of 500 mg/L. Other residential costs include home softeners, bottled water, and increased use of soap and detergents. Additionally, installation and operation of home softening units add additional salt (TDS) to the wastewater stream, which further limits wastewater disposal and recycling options as described below. Therefore, a project is required to improve the drinking water quality to meet water quality targets established in the HUA MOU (described below).

Water Supply

Current potable demands in the Hollister Urban Area are 5,856 AFY and are projected to increase to 10,371 AFY in the year 2025 (2010 UWMP, Table 3-12) (Exhibit 1.8). Potable water supplies currently include municipal groundwater and imported surface water from the CVP. The imported CVP water is treated at the existing Lessalt WTP. On average, groundwater accounts for approximately 75 percent and the CVP water accounts for approximately 25 percent of the potable supplies (UWMP, Table 4-7).

The General Plans adopted by the City and San Benito County anticipate continued significant growth until 2023. Based on data from the California Department of Finance, the County population is projected to increase from 57,490 in 2005 to 76,901 in 2023. Projected potable demand associated with this growth is 4,515 AFY (UWMP, Table 3-12).

Current and projected demands can be met by the existing supplies in normal (non-drought) conditions. However, in critically dry years, municipal supplies may be reduced to approximately 60 percent of contract entitlements and in multiple dry year conditions, up to 50 percent (Master Plan, Page 1-7). Based on current trends, it is likely that the reliability of imported CVP supplies will continue to decline in the future. Therefore, a long-term plan is required for a reliable water supply to meet the projected growth defined by the City of Hollister and San Benito County General Plans.

A potential source of supply for the HUA is recycled water. The City of Hollister constructed the Water Reclamation Facility (WRF) in 2009. The recycled water TDS concentration needs to be 700 to 800 mg/L as an upper limit for irrigation of high value agricultural crops in the HUA. However, due to TDS levels greater than 1,100 mg/L, the recycled water can not be beneficially used for agricultural irrigation and is currently percolated or disposed of with sprayfield irrigation. A reduction in the TDS of the potable water supply will result in a reduction in the TDS of the recycled water which can then be beneficially used as a reliable supply for the HUA.

Additionally, the Lessalt WTP, which treats the imported CVP potable supplies, requires upgrades to meet the Stage 2 Disinfection Byproducts Rule (Stage 2 DBP Rule). The Lessalt WTP was constructed prior to the promulgation of the Stage 2 DBP Rule. The rule strengthens public health protection for potable water customers by tightening compliance monitoring requirements for two groups of DBPs, trihalomethanes (TTHM) and haloacetic acids (HAA5). In order to meet these new standards, the Lessalt WTP must be upgraded to remove organics in the CVP water supply. Without the proposed upgrades, the Lessalt WTP cannot remain in operation, further jeopardizing the region's ability to provide a safe and reliable water supply.

Therefore, due to wastewater discharge requirements, water quality needs, and water supply demands, a more effective balance in the use of water resources was required in the HUA. As described below, the 2008 Master Plan was developed to guide an integrated approach to optimize water supply, wastewater management, and water recycling. The HUA Water Project was a recommendation developed in the Master Plan to meet the needs described above and accomplish the following goals:

- Provide a reliable and sustainable water supply to meet the current and future demands of the HUA.
- Improve the quality of municipal drinking water, industrial supply, and recycled water for urban and agricultural irrigation users.
- Achieve the goals of the City of Hollister (COH) Long-Term Wastewater Management Plan and the Sunnyslope County Water District (SSCWD) Long-Term Wastewater Management Plan.

7.2.2 Project Development and Selection

To develop the best plan to achieve the needs of the community, a comprehensive alternatives development and screening process was completed in the 2008 Master Plan. The original recommendations for water supply improvements for the HUA were later updated and refined in the 2010 Coordinated Water Supply and Treatment Plan (2010 Coordinated Plan) (Exhibit 7.7). That process resulted in a wide range of concepts and specific alternatives to meet the needs of the community. The 2011 Hollister Urban Area Water and Wastewater Master Plan and Coordinated Water Supply and Treatment Plan Program Environmental Impact Report (PEIR) (Exhibit 7.8) refined the alternatives analysis, which included:

- No Project.
- Alternative 1 - Increased Imported Surface Water Supply.
- Alternative 2 - Utilize Local Surface Water Supply.
- Alternative 3 - Demineralize Urban Wells.
- Alternative 4 - Utilize Water from High Groundwater Basins.

The HUA Water Project, submitted as part of this grant application, essentially implements Alternative 1 from the PEIR, making use of existing CVP water supply entitlements that have not been fully realized in the past. The other alternatives, or some combination thereof, will be needed in the future as development occurs and water demands increase. Alternatives 2 and 4 could be implemented following the HUA Water Project and the water supplies provided could be treated at the West Hills and upgraded Lessalt WTPs, which are included in the HUA Water Project. Alternative 3 relied on demineralization of existing and future municipal wells. Demineralization would be accomplished using reverse osmosis, which is an energy intensive and costly process. In addition, it was determined that brine disposal could have potentially significant impacts related to water quality and biological resources. Thus, it was determined that the surface water treatment concepts were preferred. The HUA Water Project described herein would rely on existing CVP water entitlements, thus reducing the need for additional raw water infrastructure which are required under Alternatives 2 and 4.

The overall HUA Water Project concept is to reduce the potable water quality TDS and hardness by increasing the blend ratio of treated CVP water to groundwater, thereby reducing the TDS and hardness in the wastewater, satisfy WDRs, reducing or eliminating the need for water softeners, and increasing the beneficial use opportunities of the recycled water. As previously described, the potable water supply in the HUA is provided by a combination of local groundwater and imported surface water from the CVP. Historically, TDS concentrations in groundwater range

from 800 to 1,200 milligrams per liter (mg/L) while imported CVP surface water has TDS concentrations ranging from 250 to 300 mg/L. Historically, total hardness concentrations in the groundwater range from 340 to 480 mg/L as calcium carbonate (CaCO₃) and CVP sources have a hardness concentration of approximately 110 mg/L as CaCO₃.

The current HUA water supply is composed of three quarters municipal groundwater (3.7 mgd) and one quarter treated surface water from the existing Lessalt WTP (1.7 mgd). This blend of water results in an average hardness of approximately 340 mg/L and an average TDS of approximately 690 mg/L. The HUA Water Project will provide more treated surface water, approximately 4.25 mgd average annual production, which will reduce the level of TDS by approximately 27 percent and the level of hardness by approximately 27 percent in the potable water supply. The anticipated future water quality has been quantified with a simple mass balance and will be measured by water quality testing as described in Attachment 6.

The ability to blend additional CVP water with groundwater has been limited by the treatment capacity of CVP raw water, not the CVP contracted assignment. SBCWD has a contract with the United States Bureau of Reclamation (USBR), Contract No. 8-07-20-W0130, for up to 8,250 acre-feet per year (AFY) of Municipal and Industrial (M&I) Central Valley Project (CVP) supply, SBCWD has not been able to use its full entitlement because the demand for raw M&I water combined with the capacity of the Lessalt WTP has not been sufficient to use the full amount. Due to the USBR's Shortage Policy, during times of shortage, the annual allocation of supply is based on actual historic use. Thus, by increasing the average use in normal and wet years, the quantity of water available in shortage years will also be increased, and therefore, the overall supply for the HUA will be more reliable. Similarly, increasing the use of surface water provides better conjunctive use and balance of the water supplies. More surface water can be used in wet and normal years, such that groundwater pumping can be reduced and reserved for dry years when less surface water is available.

Raw CVP water is supplied to the Lessalt WTP from the Hollister Conduit of the CVP, which conveys water from both the San Luis and San Justo Reservoirs. Since the plant was placed in service in 2002, it has been operated at a reduced capacity due to hydraulic constraints and the inability to treat iron and manganese from water supplied by San Justo Reservoir. Additionally, the WTP does not comply with the Stage 2 DBP Rule. Therefore, upgrades to the Lessalt WTP are required to meet the Stage 2 DBP Rule, to treat iron and manganese, and improve system hydraulics. Without the proposed upgrades, the Lessalt WTP cannot remain in operation, jeopardizing the region's ability to improve blend potable water quality.

In addition to the Lessalt WTP upgrade, a new surface water treatment plant is required to provide the required treatment capacity needed to fully utilize the CVP supplies and reduce the potable water TDS and hardness levels. The new West Hills Treatment Plant, a new raw water pump station and pipeline, and a new treated water transmission pipeline will satisfy the additional treatment capacity needed.

The overall purpose of the HUA Water Project is to:

- Provide a reliable and sustainable water supply to meet the current and future demands of the HUA.
- Improve the quality of municipal drinking water, industrial supply, and recycled water for urban and agricultural irrigation users.
- Achieve the goals of the City of Hollister (COH) Long-Term Wastewater Management Plan and the Sunnyslope County Water District (SSCWD) Long-Term Wastewater Management Plan.

The HUA Water Project required the following project elements to achieve the purpose:

- Upgrade of the Lessalt WTP,
- New transmission pipeline from the Lessalt WTP to Ridgemark, and
- New West Hills WTP and its associated raw and treated water pipelines and raw water pump station.

The February 2012 Lessalt WTP Process Alternatives Evaluation Technical Memorandum (Exhibit 7.9) presented and evaluated four alternatives for the Lessalt WTP upgrade project, including:

- Microfiltration followed by Nanofiltration
- Greensand Filtration and GAC contactors followed by Microfiltration
- Microfiltration and GAC
- Source Water Improvement (e.g., reservoir mixing or oxygenation)

The alternatives were evaluated based on capital costs, present worth costs, ability to provide additional capacity for peak production, flexibility for future expansion, operational complexity, and site compatibility and environmental factors. The source water improvement option was ruled out as infeasible. The costs of the three treatment alternatives were comparable. The greensand filtration, GAC, Microfiltration alternative was selected because it best met both the economic and noneconomic criteria.

The West Hills WTP is a new a water treatment plant. Many alternatives for the site selection and process components were evaluated in the December 2011 West Hills Water Treatment Plant Preliminary Design Report (2011 PDR) (Exhibit 7.10). Since that report was finalized, it was determined that initial capacity of the plant would be limited to 4.5 mgd due to funding limitations and rate impacts associated with the larger 6.0 mgd capacity plant which forms the basis of 2011 PDR.

Three sites were originally considered for the plant, including a site on the north side of the HUA, a site on the southeast side of the HUA, and a site on the southwest side of the HUA. The southwest site was ultimately selected because the City and SSCWD already owned the parcel. In addition, that site is located in the hills above the HUA and will take advantage of the

elevation to supply water by gravity to the HUA, thus reducing the pumping needs and associated costs. Other criteria that were considered included the flexibility for future expansion (the southwest site has more than enough space), proximity to the raw water supply, plant access and serviceability, and potential environmental concerns.

7.2.3 Project Description

The facilities and programs included in the HUA Water Project and required to deliver the project benefits include:

- Upgrade of the Lessalt WTP,
- New transmission pipeline from the Lessalt WTP to Ridgemark,
- New West Hills WTP and its associated raw and treated water pipelines and raw water pump station, and
- Institutional Agreements.

These project elements are described in detail below.

Lessalt WTP Upgrade

The Lessalt WTP, located at the intersection of Sunnyslope Road and Fairview Road in Hollister, CA, was originally completed in 2002 with a nominal design capacity of 3.0 mgd. Raw water is supplied to the water treatment plant from the Hollister Conduit of the CVP, which conveys raw CVP water from both the San Luis and San Justo Reservoirs. Since the plant was placed in service in 2002, it has been operated at a reduced capacity due to hydraulic constraints and the inability to treat iron and manganese from water supplied by San Justo Reservoir. Additionally, the Lessalt WTP was constructed prior to the promulgation of the Stage 2 DBP Rule and does not comply with those requirements.

The Lessalt WTP upgrade will include the addition of new processes to remove organic material to meet the Stage 2 Disinfection Byproducts Rule (Stage 2 DBP Rule), process improvements to treat iron and manganese, and hydraulic improvements.

The process improvements include the addition of pressurized greensand roughing filters to remove iron and manganese, granular activated carbon (GAC) contactors to improve organics removal, and replacement of the original microfiltration membranes to remove solids. Oxidation and coagulation chemical systems will also be added.

The hydraulic improvements will include new raw water connections both upstream and downstream of San Benito County Water District's existing 9L Pump Station to take advantage of those times when pressure in the Hollister Conduit is sufficient to meet pressure requirements. In addition, a new treated water pump station will serve the middle pressure zone and will include dedicated pumps to serve to the Ridgemark/high pressure zone. The upgraded Lessalt WTP will have a nominal design capacity of 2.0 mgd.

Pipeline to Ridgemark/High Zone

A new 16-inch diameter transmission pipeline will be constructed from the Lessalt WTP to the Ridgemark/high pressure zone, connecting near the intersection of Fairview Road and Maranatha Drive at the Fairview pressure reducing valve. This pipeline will convey treated surface water directly from the Lessalt WTP to the Ridgemark/high pressure zone. The purpose of this pipeline is to provide low TDS surface water to the Ridgemark/high pressure zone such that the Ridgemark Wastewater Treatment Plant can meet its WDR requirements to reduce salinity in its treated effluent.

West Hills WTP and Facilities

The West Hills WTP will be located in an unincorporated area of San Benito County just outside of the southwestern boundary of the City of Hollister in the hills north of Union Road on Richardson Road. The project includes a new surface water treatment plant, a new raw water pump station and pipeline, and a new treated water transmission pipeline.

The water treatment plant will include treatment facilities, a treated water storage tank, and an administration and operations building. Facilities will be constructed for an initial design capacity of 4.5 mgd with the potential for future expansion up to 9.0 mgd.

Treatment at the proposed plant will include: pretreatment, filtration, chemical dosing (for pre-oxidation, pH control, disinfection, and optimization of the treatment process), and a solids handling process. A clarification system will be installed for pretreatment of the raw water. Downstream of the pretreatment system, the plant's filtration system will provide supplemental removal of turbidity, coagulated organic material, and oxidized particulate iron and manganese. The solids handling process includes dewatering and storage of sludge generated from the pretreatment system and backwash water. Approximately 550,000 gallons of treated water storage will also be included at the site. Provisions for addition of a second treated water storage tank are included in the initial design.

In addition to the treatment processes, an administration and operations building will accommodate the plant operators and maintenance staff. The approximately 5,000 square foot building will house a control room, laboratory and other facilities.

Raw water will be supplied to the water treatment plant from the Hollister Conduit, which conveys raw water from both the San Luis and San Justo Reservoirs. To lift the raw water from the Hollister Conduit to the plant, a pump station will be built adjacent to the Hollister Conduit on the north side of Union Road at the intersection with Richardson Road. The pump station will include four 75 horsepower (HP) vertical turbine pumps mounted on a concrete pad at grade. A 20-inch diameter, approximately 3,500-foot long pressurized raw water pipeline will extend northeast from the pump station site within an existing easement along Richardson Road to the treatment plant.

Treated water will be delivered from the water treatment plant to the existing distribution system in a new 20-inch diameter gravity flow pipeline. The approximately 1.6 mile long pipeline will

extend from the water treatment plant along an existing 25-foot wide easement, south along Riverside Road, northeast along Nash Road, and then tie in with the existing water distribution system at the intersection of Nash Road and Line Street. The treated water pipeline will cross the San Benito River through installation in bays located in the existing County-owned Nash Road Bridge.

Institutional Agreements

The 2008 Master Plan was initiated through a Memorandum of Understanding (MOU) developed in 2004 by the City of Hollister (COH), San Benito County (SBC), San Benito County Water District (SBCWD), and which was later amended to include Sunnyslope County Water District (SSCWD). The MOU established the institutional framework to complete and the goals that formed the basis of the 2008 Master Plan, the 2010 Coordinated Plan, and the subsequent 2011 PEIR.

To implement the HUA Water Project two new institutional agreements are being prepared, the Water Supply and Treatment Agreement (WS&T Agreement) and the Water Treatment Operations and Maintenance Agreement (O&M Agreement)

The Water Supply and Treatment Agreement is an agreement between the SBCWD, COH and SSCWD which defines the terms and conditions under which the SBCWD will provide wholesale treated surface water to COH and SSCWD for municipal and industrial use in the HUA. Under this agreement, the COH and SSCWD will continue to own and use their existing municipal groundwater wells in conjunction with the treated surface water provided by SBCWD. The COH and SSCWD distribution systems have multiple interconnections and serve three pressure zones (Low, Middle, Ridgemark/High). The WS&T Agreement defines the zone of use and allocations of the treated water from each treatment plant in order to balance and maximize the water quality benefits across the two distribution systems and to ensure that sufficient surface water is provided to the Ridgemark/high zone to enable the Ridgemark WWTP to meet its WDR requirements. The WS&T Agreement also defines the sources of supply, financing terms, and ownership and operation of facilities. Finally, the WS&T Agreement defines the transfer of ownership of the existing Lessalt WTP from the COH and SSCWD to the SBCWD, which will be the wholesale agency.

The O&M Agreement is an agreement between SBCWD and SSCWD. Although SBCWD will own both surface water treatment plants (Lessalt and West Hills), the intention of this agreement is for SSCWD to continue to operate the Lessalt WTP and later the West Hills WTP after construction.

7.2.4 Project Physical Benefits

The HUA Water Project delivers the following physical benefits:

- **Potable Water Quality Benefits:** Improved water quality for the existing municipal and industrial customers in the HUA, reducing TDS and hardness by approximately 27% and 33%, respectively.

- **Effluent Water Quality Benefits:** Improved effluent water quality for the wastewater treatment plants, complying with WDRs.
- **Water Supply Reliability Benefits:** Increases surface water treatment capacity from 1,740 AFY to 7,280, allowing better utilization of the contracted CVP supply.
- **Water Supply Benefits:** Improves the beneficial use opportunities of 2500 AFY of recycled water.

Water Quality

As previously described, the potable water supply in the HUA is provided by a combination of local groundwater and imported surface water from the CVP. Historically, TDS concentrations in groundwater range from 800 to 1,200 milligrams per liter (mg/L) while imported CVP surface water has TDS concentrations ranging from 250 to 310 mg/L. Historically, total hardness concentrations in the groundwater range from 340 to 480 mg/L as calcium carbonate (CaCO₃) and CVP sources have a hardness concentration of approximately 110 mg/L as CaCO₃.

The current HUA water supply is composed of three quarters municipal groundwater (3.7 mgd) and one quarter treated surface water from the existing Lessalt WTP (1.7 mgd). This blend of water results in an average hardness of approximately 340 mg/L and an average TDS of approximately 690 mg/L. The HUA Water Project will provide more treated surface water, approximately 4.25 mgd average annual production, which will reduce the levels of both hardness and TDS in the potable water supply. The anticipated future water quality has been quantified with a simple mass balance and can later be confirmed with water quality testing which is reported regularly to the Department of Public Health.

The reduced TDS and hardness in the potable water supply will result in a reduced TDS and hardness in the wastewater treatment plant effluent, complying with WDRs. Treated wastewater effluent typically has TDS concentrations of approximately 1,200 mg/L at the City Wastewater Treatment Plant and up to 1,800 mg/L at the wastewater treatment plant serving the Ridgemark area of the SSCWD.

The WDRs TDS concentration limits are 1,200 mg/L on a 30-day average at the City Wastewater Treatment Plant and 1,200 mg/L on a rolling 12-month basis. A target treated effluent TDS concentration of 500 mg/L (with a maximum limit of 700 mg/L) was established in the MOU to increase recycling and disposal opportunities. The HUA Water Project will reduce effluent levels to approximately 700 to 850 mg/L, complying with WDRs.

Additionally, with the introduction of treated surface water to the Ridgemark/high pressure zone, the improved potable water quality will enable the removal of water softeners within the Ridgemark WWTP sewershed. This in turn will help the WWTP to meet its WDR requirements for salinity reduction.

The effluent salinity levels (TDS, chlorine, and sodium concentrations) will be monitored quarterly and reported to the Regional Water Quality Control Board as described in Attachment 6.

Water Supply

In addition to the water quality benefits described above, the reliability of the water supply will be improved. Although the SBCWD has a contract with the United States Bureau of Reclamation (USBR), Contract No. 8-07-20-W0130, for up to 8,250 acre-feet per year (AFY) of Municipal and Industrial (M&I) Central Valley Project (CVP) supply, SBCWD has not been able to use its full entitlement because the demand for raw M&I water combined with the capacity of the Lessalt WTP has not been sufficient to use the full amount. Due to the USBR's Shortage Policy, during times of shortage, the annual allocation of supply is based on actual historic use. Thus, by increasing the average use in normal and wet years, the quantity of water available in shortage years will also be increased, and therefore, the overall supply for the HUA will be more reliable. Similarly, increasing the use of surface water provides better conjunctive use and balance of the water supplies. More surface water can be used in wet and normal years, such that groundwater pumping can be reduced and reserved for dry years when less surface water is available. The water supply benefits will be measured by the annual CVP allocation.

Additionally, the relatively high mineral content in effluent from the Water Reclamation Facility (WRF) limits recycling options due to adverse impacts to crops. An improvement of the potable water quality will also result in improved recycled water quality from the City WRF. 2500 AFY of recycled water, which is currently percolated or disposed of with sprayfield irrigation, is expected to be used for irrigation of high value agricultural crops once both surface water treatment plants are in operation and the TDS concentration is reduced. As described in the Recycled Water Facilities Plan, Use Area Evaluation Technical Memorandum (Exhibit 7.11), the recycled water would be used along the corridor of an existing recycled water transmission pipeline (from the WRF to the sprayfield site) in an area estimated to be approximately 1900 acres. Thus, only grower-supplied infrastructure (turnouts, irrigation piping, valving, sprinklers, etc.) are needed to realize this benefit. Both the recycled water quality and quantity will be monitored and reported to the Regional Water Quality Control Board as part of the requirements of the City Master Reclamation Permit requirements.

7.2.5 Without Project Conditions

Without the HUA Water Project, the West Hills WTP would not be constructed and the Lessalt WTP could not continue operation because the existing treatment process cannot achieve the requirements under the Stage 2 D/DBP Rule, which take effect in the fall of 2013. As a result, the potable water quality in the HUA would actually decline from current conditions. Furthermore, the pipeline from the Lessalt WTP to the Ridgemark/high pressure zone would not be constructed and that area of the system would continue to rely solely on municipal groundwater wells with high mineral and salt content. As a result, the SSCWD could not comply with the WDR for the Ridgemark WWTP to reduce its effluent salinity and the district would likely incur fines from the Regional Water Quality Control Board.

Since the salinity in the potable water supply will actually increase, it is unlikely that the recycled water from the COH Water Reclamation Facility would be suitable for irrigation of high

value agricultural crops. The existing TDS in the plant effluent ranges between 1,000 – 1,200 mg/L and it is expected that would increase if the Lessalt WTP was decommissioned.

Without the two surface water treatment plants (Lessalt and West Hills), the COH and SSCWD would rely solely on municipal groundwater wells for potable water supply. Careful management of the groundwater would be needed to avoid overdraft in the future. SBCWD could use its CVP allocation in percolation ponds to augment the groundwater supply; however, the water quality would be compromised (TDS and hardness would increase).

The annual project physical benefits for the following parameters are shown in the tables below:

- Potable water quality measured in mg/L hardness
- Effluent water quality measured in mg/L TDS
- Water supply reliability measured in acre-feet per year
- Recycled water supply measured in acre-feet per year

7.2.6 Potential Adverse Effects

The project involves optimizing the existing CVP assignment and does not involve any new impacts to CVP system. The Lessalt WTP upgrade and the pipeline to the Ridgemark/high do not have any anticipated adverse physical effects. They are being implemented under a CEQA categorical exemption.

The Draft Environmental Impact Report for the West Hills WTP is currently being prepared. Issues raised during the scoping period pertain to biological resources, including special-status species such as the California tiger salamander, burrowing owl, San Joaquin kit fox, and western spadefoot toad. Impacts that have been identified as Significant and Unavoidable in Administrative Draft EIR, include temporary and cumulative noise and visual impacts.

Annual Project Physical Benefits			
Project Name: HUA Water Project			
Type of Benefit Claimed: Potable Water Quality			
Measure of Benefit: mg/l TDS			
Additional Information about this Measure: Estimated based on mass balance of projected blend of groundwater and surface water supplied to the potable water system.			
	Physical Benefits		
Year	Without Project	With Project	Change Resulting from Project
2013	690 mg/L		0 mg/L
2014	690 mg/L		0 mg/L
2015	690 mg/L	330 mg/L	0 mg/L
2016	690 mg/L	280 mg/L	90 mg/L
2017	690 mg/L	230 mg/L	170 mg/L
2018	690 mg/L	230 mg/L	180 mg/L
2019	690 mg/L	230 mg/L	190 mg/L
2020	690 mg/L	220 mg/L	190 mg/L
2021	690 mg/L	220 mg/L	200 mg/L
2022	690 mg/L	210 mg/L	210 mg/L
2023	690 mg/L	210 mg/L	210 mg/L
2024	690 mg/L	210 mg/L	220 mg/L
2025	690 mg/L	210 mg/L	220 mg/L
2026	690 mg/L	210 mg/L	210 mg/L
2027	690 mg/L	220 mg/L	200 mg/L
2028	690 mg/L	220 mg/L	190 mg/L
2029	690 mg/L	230 mg/L	180 mg/L
2030	690 mg/L	230 mg/L	180 mg/L
2031	690 mg/L	230 mg/L	170 mg/L
2032	690 mg/L	240 mg/L	160 mg/L
2033	690 mg/L	240 mg/L	160 mg/L
2034	690 mg/L	250 mg/L	150 mg/L
2035	690 mg/L	250 mg/L	140 mg/L
2036	690 mg/L	250 mg/L	140 mg/L
2037	690 mg/L	260 mg/L	130 mg/L
2038	690 mg/L	260 mg/L	120 mg/L
2039	690 mg/L	260 mg/L	120 mg/L
2040	690 mg/L	270 mg/L	110 mg/L
2041	690 mg/L	270 mg/L	110 mg/L
2042	690 mg/L	270 mg/L	100 mg/L
2043	690 mg/L	270 mg/L	100 mg/L
2044	690 mg/L	280 mg/L	90 mg/L
2045	690 mg/L	280 mg/L	90 mg/L
Comments: The TDS in the existing groundwater supply ranges from 8000 to 1200 mg/L. The TDS in the imported CVP supply ranges from 250 to 310 mg/L.			

Annual Project Physical Benefits

Project Name: HUA Water Project

Type of Benefit Claimed: Effluent Water Quality

Measure of Benefit: mg/l TDS

Additional Information about this Measure: Mass balance of projected blend of groundwater and surface water.

The WDRs for the WRF and SSCWD's Ridgemark WTP have effluent TDS limitations of 1200 mg/L TDS. In addition to the high salt content in the existing groundwater supply, the use of water softeners introduces a significant amount of additional TDS.

Using more surface water supply (with a lower salt content) will allow residents to remove their softeners.

Physical Benefits			
Year	Without Project	With Project	Change Resulting from Project
2013	1200 – 1800 mg/L		0 - 0 mg/L
2014	1200 – 1800 mg/L		0 - 0 mg/L
2015	1200 – 1800 mg/L	1140 mg/L	60 - 660 mg/L
2016	1200 – 1800 mg/L	850 mg/L	350 - 950 mg/L
2017	1200 – 1800 mg/L	770 mg/L	430 - 1030 mg/L
2018	1200 – 1800 mg/L	760 mg/L	440 - 1040 mg/L
2019	1200 – 1800 mg/L	750 mg/L	450 - 1050 mg/L
2020	1200 – 1800 mg/L	750 mg/L	450 - 1050 mg/L
2021	1200 – 1800 mg/L	740 mg/L	460 - 1060 mg/L
2022	1200 – 1800 mg/L	730 mg/L	470 - 1070 mg/L
2023	1200 – 1800 mg/L	730 mg/L	470 - 1070 mg/L
2024	1200 – 1800 mg/L	720 mg/L	480 - 1080 mg/L
2025	1200 – 1800 mg/L	720 mg/L	480 - 1080 mg/L
2026	1200 – 1800 mg/L	730 mg/L	470 - 1070 mg/L
2027	1200 – 1800 mg/L	740 mg/L	460 - 1060 mg/L
2028	1200 – 1800 mg/L	750 mg/L	450 - 1050 mg/L
2029	1200 – 1800 mg/L	760 mg/L	440 - 1040 mg/L
2030	1200 – 1800 mg/L	760 mg/L	440 - 1040 mg/L
2031	1200 – 1800 mg/L	770 mg/L	430 - 1030 mg/L
2032	1200 – 1800 mg/L	780 mg/L	420 - 1020 mg/L
2033	1200 – 1800 mg/L	780 mg/L	420 - 1020 mg/L
2034	1200 – 1800 mg/L	790 mg/L	410 - 1010 mg/L
2035	1200 – 1800 mg/L	800 mg/L	400 - 1000 mg/L
2036	1200 – 1800 mg/L	800 mg/L	400 - 1000 mg/L
2037	1200 – 1800 mg/L	810 mg/L	390 - 990 mg/L
2038	1200 – 1800 mg/L	820 mg/L	380 - 980 mg/L
2039	1200 – 1800 mg/L	820 mg/L	380 - 980 mg/L
2040	1200 – 1800 mg/L	830 mg/L	370 - 970 mg/L
2041	1200 – 1800 mg/L	830 mg/L	370 - 970 mg/L
2042	1200 – 1800 mg/L	840 mg/L	360 - 960 mg/L
2043	1200 – 1800 mg/L	840 mg/L	360 - 960 mg/L
2044	1200 – 1800 mg/L	850 mg/L	350 - 950 mg/L
2045	1200 – 1800 mg/L	850 mg/L	350 - 950 mg/L

Comments: The TDS in the existing groundwater supply ranges from 800 to 1200 mg/L. The TDS in the imported CVP supply ranges from 250 to 310 mg/L. An estimated 250 mg/L TDS is added to the wastewater through typical M&I usage. In addition, it is estimated that an additional 300-400 mg/L TDS is added to the wastewater stream by residential water softeners.

Annual Project Physical Benefits

Project Name: HUA Water Project

Type of Benefit Claimed: Water Supply Reliability

Measure of Benefit: acre-feet per year

Additional Information about this Measure: Based on projected annual treatment of imported water at Lessalt and West Hills. District's existing CVP M&I Entitlement is for 8,250 acre-feet per year (AFY). However, historical use is currently set at 5,556 AFY. By using more imported surface water on a regular basis, the District should be able to increase its historical use, thereby making the imported water more reliable.

	Physical Benefits		
Year	Without Project	With Project	Change Resulting from Project
2013	1305	0 AFY	0 AFY
2014	0	0 AFY	0 AFY
2015	0	2240 AFY	2240 AFY
2016	0	3500 AFY	3500 AFY
2017	0	4760 AFY	4760 AFY
2018	0	5060 AFY	5060 AFY
2019	0	5360 AFY	5360 AFY
2020	0	5660 AFY	5660 AFY
2021	0	6010 AFY	6010 AFY
2022	0	6360 AFY	6360 AFY
2023	0	6710 AFY	6710 AFY
2024	0	7060 AFY	7060 AFY
2025	0	7280 AFY	7280 AFY
2026	0	7280 AFY	7280 AFY
2027	0	7280 AFY	7280 AFY
2028	0	7280 AFY	7280 AFY
2029	0	7280 AFY	7280 AFY
2030	0	7280 AFY	7280 AFY
2031	0	7280 AFY	7280 AFY
2032	0	7280 AFY	7280 AFY
2033	0	7280 AFY	7280 AFY
2034	0	7280 AFY	7280 AFY
2035	0	7280 AFY	7280 AFY
2036	0	7280 AFY	7280 AFY
2037	0	7280 AFY	7280 AFY
2038	0	7280 AFY	7280 AFY
2039	0	7280 AFY	7280 AFY
2040	0	7280 AFY	7280 AFY
2041	0	7280 AFY	7280 AFY
2042	0	7280 AFY	7280 AFY
2043	0	7280 AFY	7280 AFY
2044	0	7280 AFY	7280 AFY
2045	0	7280 AFY	7280 AFY

Comments: Under existing operations, approximately 1740 AFY treated at Lessalt WTP. The project will provide an annual treatment capacity of 7,280 AFY. Initially, the new West Hills WTP would be operated at a lower capacity, but would increase over time as demand increases. Without the process upgrades at the Lessalt WTP, the plant would be decommissioned.

Annual Project Physical Benefits

Project Name: HUA Water Project

Type of Benefit Claimed: Water Supply - Recycled Water

Measure of Benefit: acre-feet per year

Additional Information about this Measure: Estimated as the quantity of water used for irrigation of high value agriculture. The HUA Water Project will improve potable water quality, which in turn will improve the quality of recycled water at the local wastewater treatment plants. Treated effluent is currently disposed of through percolation ponds or sprayfield irrigation. With the improved quality, the recycled water can be used for beneficial uses (i.e., irrigation of high value agriculture) nearby existing facilities without additional infrastructure.

	Physical Benefits		
Year	Without Project	With Project	Change Resulting from Project
2016 - 2045	0 AFY	2500 AFY	2500 AFY
Comments: Refer to the Recycled Water Facilities Plan, Use Area Evaluation Technical Memorandum.			

7.3 Technical Justification Project 2 Critical Water Supply System Improvements for Pajaro (DAC)

The Pajaro Sunny Mesa Community Services District (PSMCSD) was incorporated in 1992 and provides water service to multiple unincorporated areas in northern Monterey County. Of the public water systems that PSMCSD operates, only the communities of Pajaro and Sunny Mesa are within the Pajaro River Watershed IRWM area. These two communities are geographically separated and currently have no water system interconnections; each system is operated independently from its own infrastructure. The Pajaro community has been identified as a Disadvantaged Community (DAC) as defined in the IRWM Grant Program Guidelines and it is included in DWR's online DAC mapping tool (Figure 7.6).

7.3.1 Project Need

PSMCSD currently serves a total of 453 connections in the Pajaro community. The Pajaro system consists of a single 1,500 gallon per minute (gpm) well, one above-ground 600,000 gallon welded steel storage tank, and a booster pump system utilizing hydropneumatic tanks. This design severely limits the operational flexibility of the system. If the existing tank is taken out of service for repairs or in case of an emergency, there is no back-up storage for the system. Also, the existing tank is over 30 years old and in need of maintenance, as noted in the tank inspection report dated February 2, 2013 (Exhibit 7.12). As seen in one photo below, the exterior and interior is corroding with as much as 33% corrosion on the hatch and vent. The inspection recommendation called for blasting and recoating the tank. In order to make these repairs, the existing storage tank would need to be out of service for 6-12 weeks, which is currently untenable because this is the only tank serving the community (*Pajaro Sunny Mesa CSD – Proposition 84 Preliminary Engineering Report*, February 20, 2013) (Exhibit 7.13).


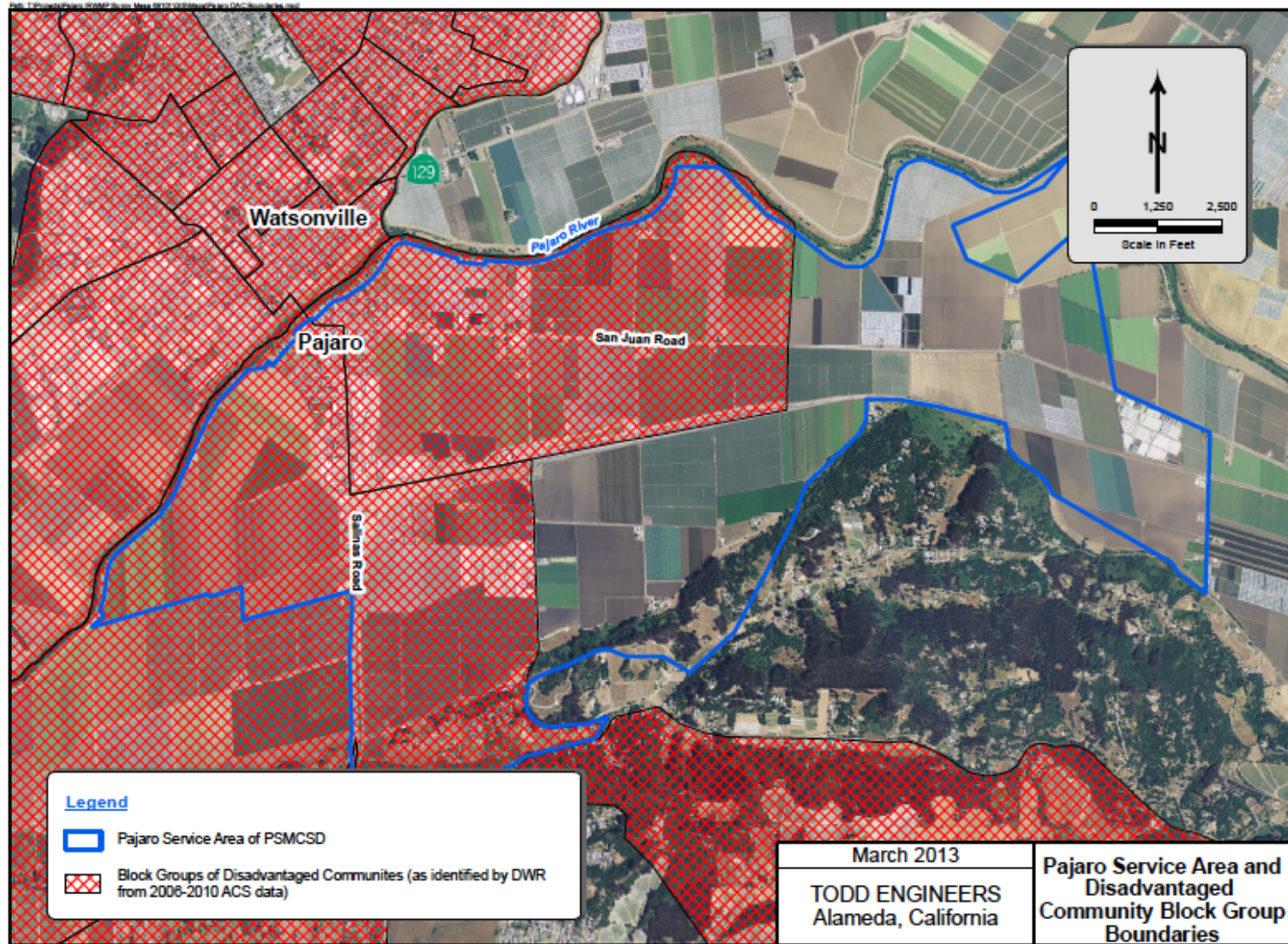
Access Hatch Condition	
<p>Coating Condition: Poor</p> <p>Corrosion Present: Y <input checked="" type="checkbox"/> N <input type="checkbox"/></p> <p>Seams/Welds Condition: Good</p> <p>Oxidation Present? Y <input checked="" type="checkbox"/> N <input type="checkbox"/></p> <p>De-lamination Present? Y <input checked="" type="checkbox"/> N <input type="checkbox"/></p> <p>Hatch Size: 2 foot square</p> <p>Hatch Locked? Y <input checked="" type="checkbox"/> N <input type="checkbox"/></p> <p>Hinge Condition: Good</p> <p>Gasket Present? Y <input type="checkbox"/> N <input checked="" type="checkbox"/></p> <p>Intact? Y <input type="checkbox"/> N <input type="checkbox"/> N/A <input checked="" type="checkbox"/></p> <p>Insects, Dirt Or Debris Present Under Hatch? Y <input type="checkbox"/> N <input checked="" type="checkbox"/></p> <p>Summary: The hatch was found locked with no gasket present and in poor condition with biological growth, de-alloying, heavy oxidation, de-lamination and 33% surface corrosion noted. Recommend a gasket.</p>	

Figure 7.6 Pajaro Service Area and Disadvantaged Community Block Group Boundaries



The California Department of Public Health (CDPH) and California Water Code require a public water system with fewer than 1,000 connections to have storage capacity equal to or greater than the system's maximum day demand (MDD), unless the system can demonstrate that it has an additional source of supply or has an emergency source connection that can meet the MDD requirement (CCR Title 22, Chapter 16, Article 2, Section 64554). Based on the requirements in the water code for calculating MDD, the MDD for the Pajaro community is just over 540,000 gallons. CDPH and the water code also require that new community water systems using only groundwater have a minimum of two approved sources capable of meeting MDD with the highest-capacity source off line before being granted an initial permit. These requirements do not strictly apply to the Pajaro community because this is not an application for a new permit; nonetheless, the need is demonstrated for additional storage to offset the limitations imposed by having only a single groundwater supply source.

In addition to the CDPH and water code storage requirements, California Fire Code requires the Pajaro community to have a minimum fire flow storage volume able to supply 1,500 gpm continuously for 2 hours, or 180,000 gallons in total (2010 California Fire Code, Appendix B, page 584).

These two storage requirements must both be met at all times in order for the system to function without failure during emergencies. This means that the minimum volume of storage that should be maintained at all times for the Pajaro community system is 720,000 gallons. PSMCSD currently only has the capacity to store 600,000 gallons, as noted above. Therefore, PSMCSD needs to increase the storage capacity for the Pajaro community water system.

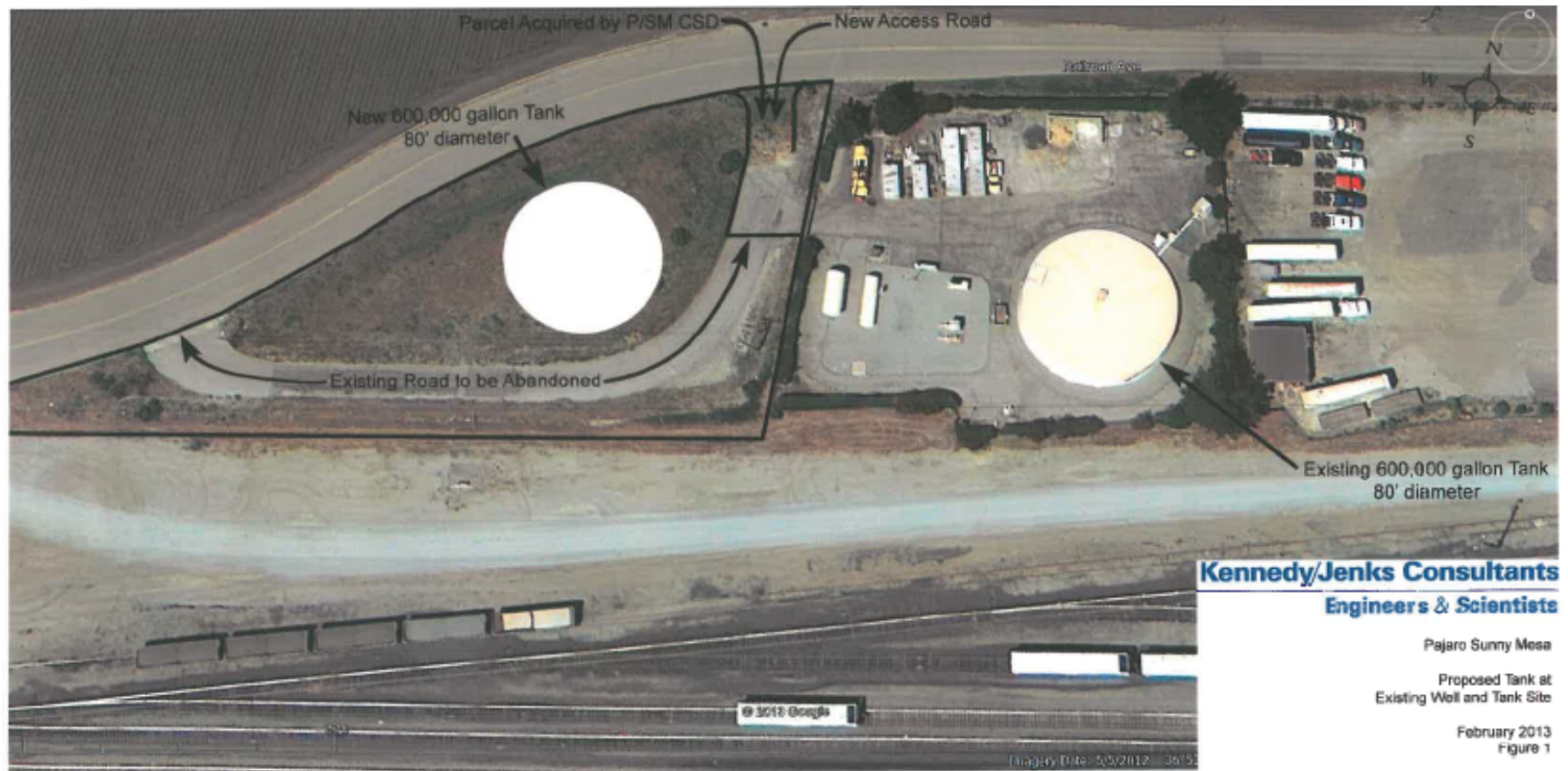
The CDPH conducted a Water System Inspection of the system in 2010 (Exhibit 7.14). The CDPH recommendation resulting from that inspection was:

It is recommended by the Department that water district should develop a Capital Improvements Plan/Equipment Replacement Plan. The Pajaro Community Service District should develop a budget that includes reserves for emergencies (e.g., emergency reserve funds for unplanned equipment repair or replacement), and reserves for Capital Improvement Projects.

The proposed project would provide for the construction of a second 600,000-gallon welded steel tank so that the existing tank can be rehabilitated later. The existing tank would be rehabilitated after construction of the new tank was completed; rehabilitation of the existing tank is not included as a part of this project.

The new tank would be constructed in an undeveloped area adjacent to the site of the existing water storage tank (Figure 7.7). The new tank would be 80-feet in diameter, with an approximate height of 20 feet. The new tank would be equipped with standard appurtenances, including access ladders, access hatches, vents, etc., and would be suitable for potable water storage.

Figure 7.7 Existing and Proposed Tank Site



7.3.2 Project Development and Selection

Three project alternatives were considered to increase the reliability and capacity of water storage for the Pajaro community:

1. Rehabilitation of the existing 600,000 gallon tank without the addition of a new tank;
2. Rehabilitation of the existing 600,000 gallon tank with the addition of a new tank; or
3. Construction of a new 1,200,000 gallon tank and demolition of the existing tank.

The existing tank has been adversely impacted by corrosion and needs rehabilitation and repair. A rehabilitation project on this tank would require that it be emptied so that the entire tank could be sandblasted and recoated, the structural steel repaired, and the degraded appurtenances repaired or replaced. This first alternative would require that the existing tank be offline for a period of six to twelve weeks while the repairs are underway. This first alternative would leave the Pajaro community without water supply storage for the duration of the repairs and would not meet the storage requirements required by CDPH and CFC.

The second alternative involves the construction of a new 600,000 gallon tank, followed later by rehabilitation and repair of the existing tank. The new tank would be constructed in the undeveloped area adjacent to the site of the existing water storage tank. The existing tank would be repaired as described in Alternative 1 after the new tank is constructed so that the system would not be off-line during construction and the community of Pajaro would have an uninterrupted supply.

The third alternative involves demolition of the existing 600,000 gallon welded steel tank and the construction of a new 1,200,000 gallon concrete storage tank. The existing tank would be demolished and sold for scrap, and a new tank would be constructed in the undeveloped area adjacent to the site of the existing water storage tank. The new tank would be a 120-foot diameter tank, with an approximate height of 20 feet. The new tank would be equipped with typical appurtenances and would be suitable for potable water storage.

Because Alternative 1 was not feasible, it was eliminated from further consideration. Alternatives 2 and 3 were further considered in the *Preliminary Engineering Report* (Exhibit 7.13). The report included a technical and feasibility analysis and preliminary cost estimate. Although the new 600,000 gallon tank followed by rehabilitation of the existing tank has a slightly higher overall capital cost, the alternative provides the required storage capacity, allows the construction to be divided into two phases (construction of a new tank and rehabilitation of the existing tank), and provides redundancy in the water supply system. Therefore, construction of a new 600,000 gallon tank was the selected alternative. This proposed project provides more benefits for water supply reliability, public health and safety, overall system resilience and more robust infrastructure and allows the rehabilitation of the existing tank to be delayed until additional funding is secured.

7.3.3 Project Description

The new facilities for the project will be limited to a new 600,000 gallon welded steel water storage tank and the piping associated with integrating this new tank into the existing water supply system infrastructure.

No new policies or changes in policy are needed. The actions required for the project are listed below and additional detail is provided in Attachment 3:

Task 1. Surveying and Geotechnical Investigations

Task 2. Grant Administration

Task 2.1. Administration

Task 2.2. Labor Compliance Program

Task 2.3. Reporting

Task 2.4. Performance Monitoring Plan

Task 3. Final Design

Task 3.1. 60% Design and Review

Task 3.2. 100% Design and Review

Task 4. Environmental Documentation

Task 5. Construction Contracting

Task 5.1. Advertising, Bidding, and Award of Construction Contract

Task 5.2. Notice to Proceed

Task 6. Construction

Task 6.1. Mobilization and Excavation

Task 6.2. Install Wick Drains

Task 6.3. Erect and Paint Tank

Task 6.4. Yard Piping and Site Improvements

Task 6.5. Close-out and Demobilization

Task 7. Environmental Compliance/Mitigation/Enhancement

Task 8. Construction Administration

7.3.4 Project Physical Benefits and Measurement

- **Water Supply Benefits:** 600,000 gallons of critical water supply storage.
- **Community Benefits:** improved public health and safety.
- **Infrastructure Benefits:** improved water supply reliability, enhanced water system resilience and more robust infrastructure.

The primary benefit of the project is provision of 600,000 gallons of storage capacity to increase system storage capacity to a total of 1.2 million gallons, and thereby meet CDPH, water code, and fire code requirements for a public water supply system. No uncertainty exists regarding the provision of the new 600,000 gallons. There is uncertainty regarding the rehabilitation of the existing 600,000 gallon tank because it will be deferred until additional funding can be secured.

Secondary benefits from the project include improved public health and safety, water supply reliability, enhanced water system resilience and more robust infrastructure. No uncertainty exists regarding these benefits.

Project benefit monitoring will be accomplished through the District’s monthly tank inspection and regular water system inspections in compliance with California Department of Public Health requirements as described in Attachment 6.

7.3.5 Without Project Conditions and Annual Benefits

Without this project, the most likely alternative would be the rehabilitation or repair of the existing storage tank. However, that rehabilitation would disrupt water service. The rehabilitation requires that the tank be emptied in order for the interior to be repaired and refinished, and it is not possible to drain the tank and provide water supply to the Pajaro community. It may be feasible for PSMCSD to rent temporary storage capacity for up to 100,000 gallons to allow the continued service of water in the community, but this volume of storage would be far too little to meet MDD, fire flow requirements, or emergency needs. The Pajaro water system is isolated and no connections to other systems are feasible. No other projects are currently planned for the Pajaro community water system.

The primary water supply benefits for with and without project conditions are presented in the table below.

Annual Project Physical Benefits			
Project Name: Critical Water Supply System Improvements for Pajaro			
Type of Benefit Claimed: Water Supply			
Measure of Benefit: gallons			
Additional Information about this Measure: additional storage meets MDD, fire flow requirements, and emergency needs.			
	Physical Benefits		
Year	Without Project	With Project	Change Resulting from Project
2015	Current storage of 600,000 gallons	Increased storage to 1,200,000 gallons	600,000 gallons
2016	Same as above	Same as above	Same as above
2017	Same as above	Same as above	Same as above
2018	Same as above	Same as above	Same as above
Etc.	Same as above	Same as above	Same as above
Last year	Same as above	Same as above	Same as above
Comments: Improvements also allow improved water supply reliability, enhanced water system resilience and more robust infrastructure.			

7.3.6 Potential Adverse Effects

No potential adverse physical effects are anticipated for this project. The proposed tank location is a small, vacant, disturbed property bordered by the existing PSMCSD storage tank site, railroad tracks, and a County Road (Railroad Avenue). In addition, excavated soil from another project was stockpiled by Monterey County on this site in anticipation of this project. No growth in the Pajaro community is anticipated to result from completion of the project. PSMCSD believes that a mitigated negative declaration based on an Initial Study will be sufficient for satisfying the CEQA process.

7.4 Technical Justification Project 3 Increased Recycled Water Storage Project

The Pajaro Valley (Figure 7.8), adjacent to Monterey Bay, is one of the most productive agricultural regions in the United States; however it has aquifers suffering from long-term groundwater overdraft and seawater intrusion. Saltwater contamination of a fresh water aquifer may result in the loss of a usable water supply without treatment in addition to a loss of aquifer storage. The Pajaro Valley Water Management Agency (PVWMA or Agency) was established in 1984 to “efficiently and economically manage existing and supplemental water supplies in order to prevent further increase in, and to accomplish continuing reduction of, long-term overdraft and to provide and ensure sufficient water supplies for present and anticipated needs within its boundaries.” Since its formation, the PVWMA has developed a Groundwater Management Plan, or Basin Management Plan (BMP), built a regional-scale hydrologic model (Hydrologic Model Analysis of Basin Management Plan Alternatives, October 2012) (Exhibit 7.15), constructed and operates a managed aquifer recharge and recovery (MAR) facility, a water recycling facility and more than 20 miles of underground distribution pipeline.

Figure 7.8 Location of the Pajaro Valley



7.4.1 Project Need

Seawater intrusion is contaminating Pajaro Valley’s primary source of water and threatening its \$800 million agricultural economy. Elevated chloride concentrations in groundwater caused by seawater intrusion were first documented in the Valley in *Bulletin 5*, a 1953 report published by the State Water Resources Board. Long-term overdraft conditions have caused groundwater levels to fall below sea level in places throughout the Valley all year long (Figure 7.9). The combination of long-term overdraft and continued groundwater extractions has caused seawater to migrate up to three miles inland (Figure 7.10), contaminating numerous extraction wells within the groundwater basin and threatening the productivity of prime agricultural land.

Figure 7.9 Groundwater Surface Elevation Map, Fall 2011

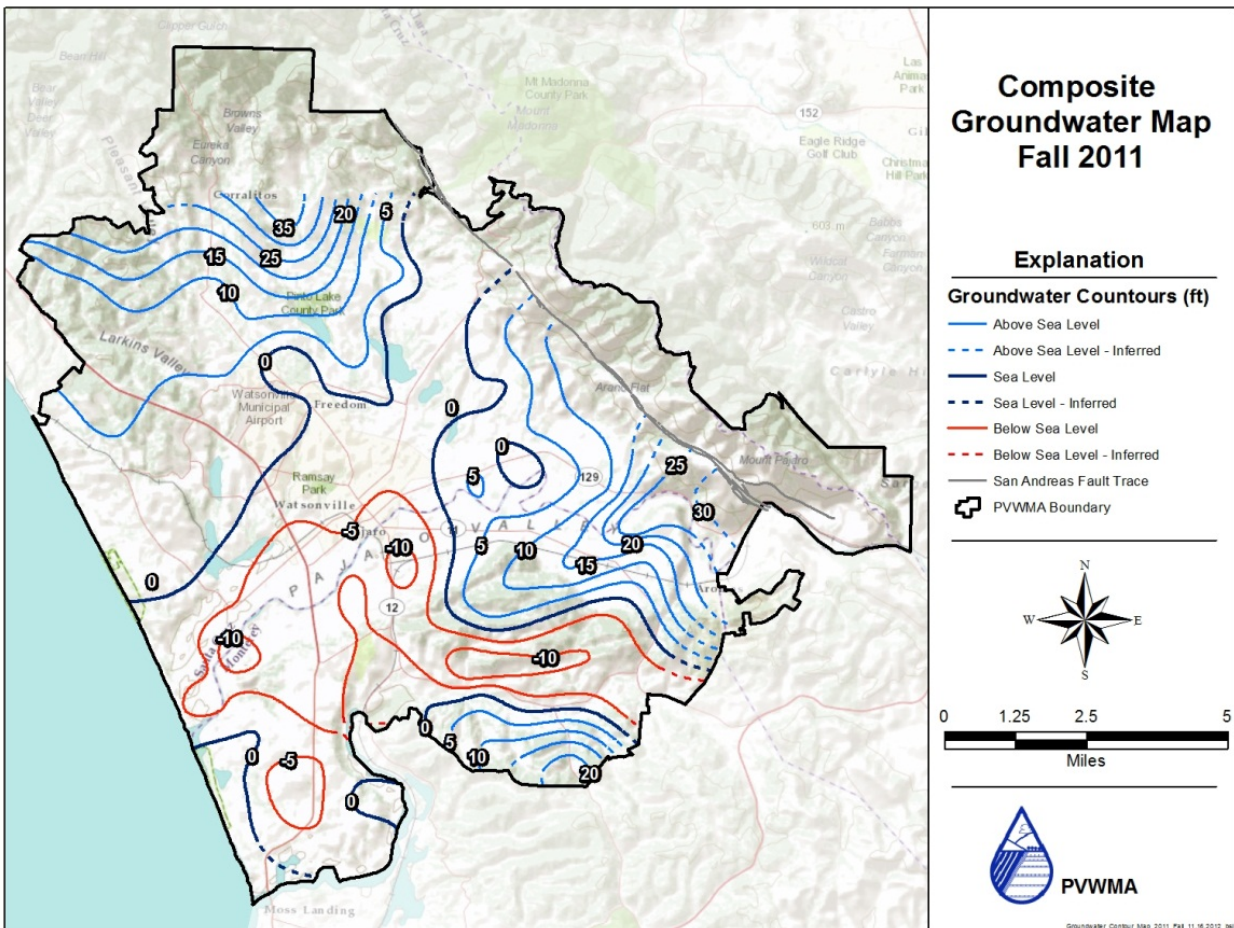
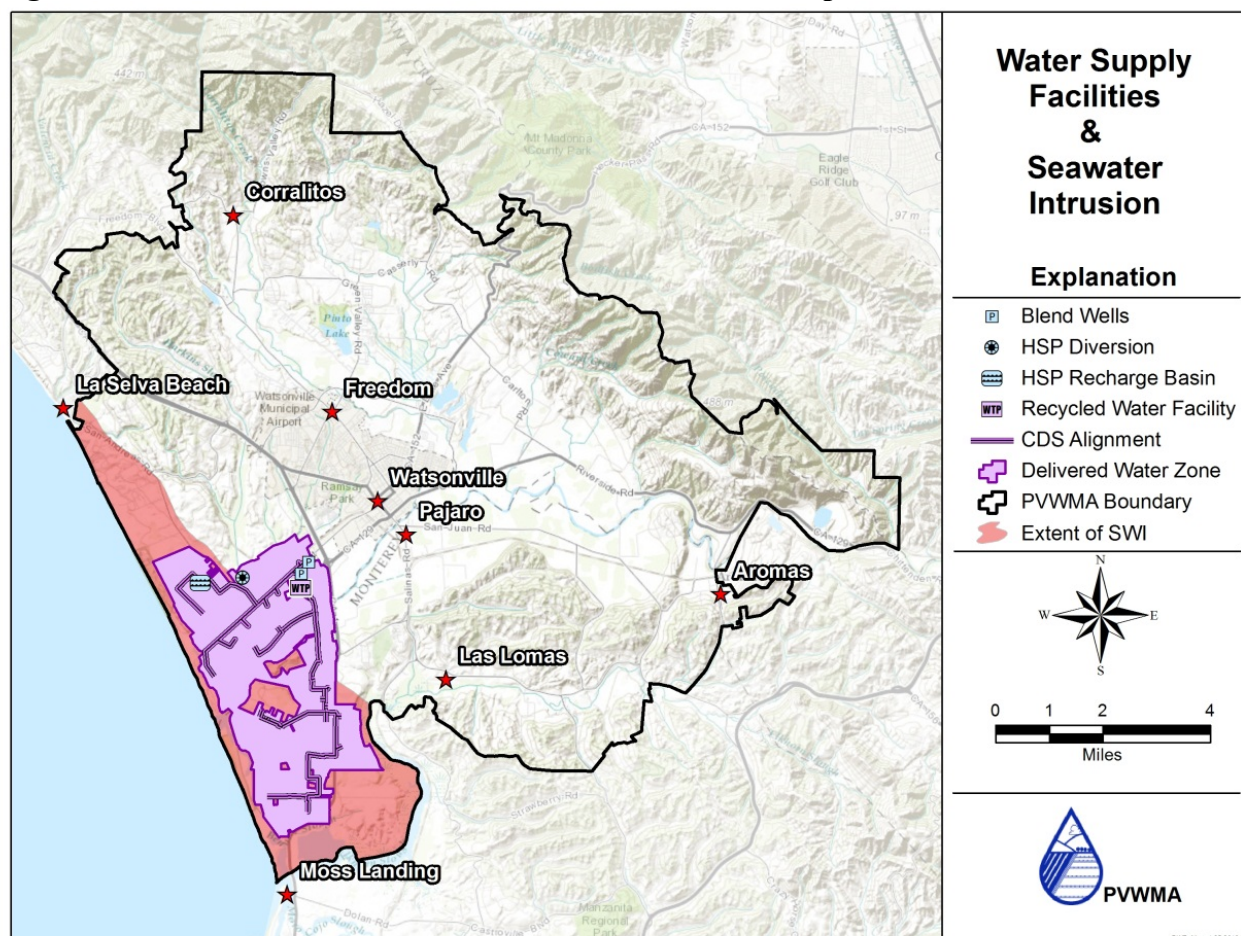


Figure 7.10 Seawater Intrusion & Delivered Water Zone Map

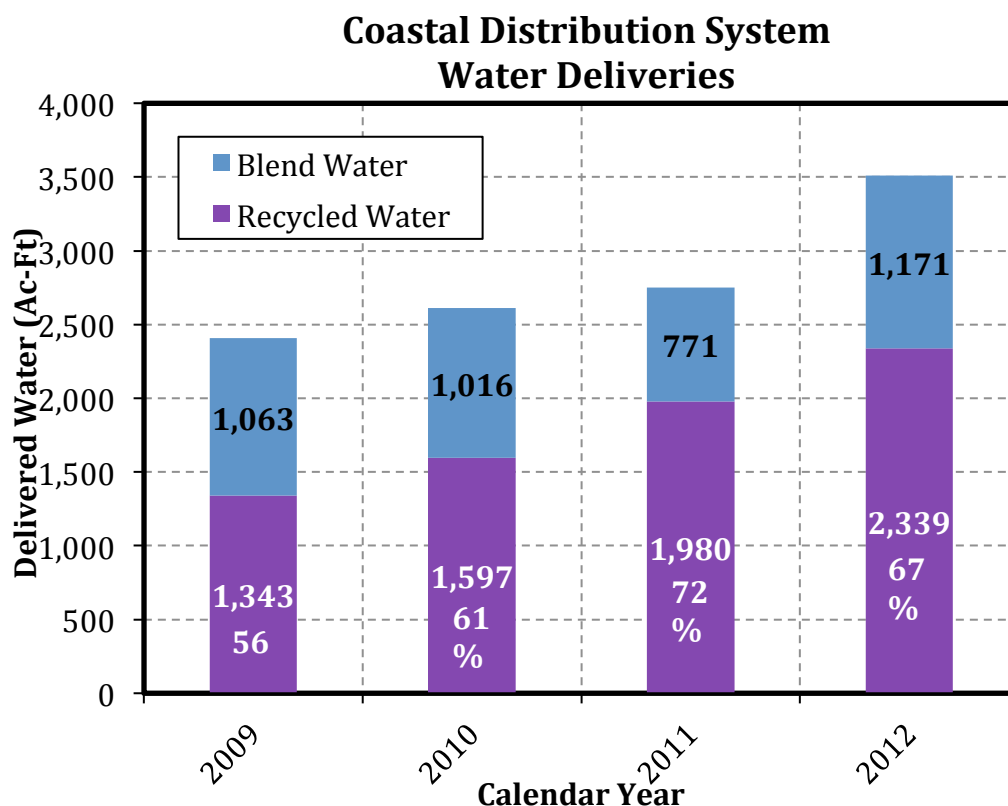


The combined effects of groundwater overdraft and seawater intrusion led first to the formation of the PVWMA, and later to the development of a Basin Management Plan (BMP) with solutions to alleviating the problems of the Valley. Hydrologic modeling showed that reducing coastal groundwater production provided the greatest impact to seawater intrusion. Building off the modeling results, several alternatives of projects and programs were detailed in the PVWMA's 2002 BMP (Exhibit 1.10), including a Local Only Alternative, and alternatives that relied on imported water from the Central Valley Project. Projects described in the 2002 BMP included a Managed Aquifer Recharge and Recovery Facility, a Water Recycling Facility, water conveyance pipeline, an import pipeline, supplemental wells and more. Each alternative, or combination of projects and programs, described in the 2002 BMP was evaluated based on five basin management strategies: 1) Ability to meet existing and future water needs; 2) Level of dependence on out-of-basin water supplies; 3) Amount of regulatory hurdles; 4) Ability to meet water quality goals; and 5) Economic Impact. The Recommended Alternative, which included the water recycling facility, was selected because it was the least costly on a cost per acre-foot basis, met the water quality goals, and provided flexibility to meet future water demands.

Recycled water is a key component of the 2002 BMP Selected Alternative. Recycled water provides the Valley with a local, reliable, safe and drought proof irrigation supply. The production of recycled water has the added benefit of reducing the discharge of secondary treated effluent into the Monterey Bay National Marine Sanctuary. To build the Watsonville Area Water Recycling Facility (Facility) the PVWMA partnered with the City of Watsonville and constructed the Facility adjacent to the existing Waste Water Treatment Plant. The facility was completed in early 2009.

The volume of recycled water produced, blended and delivered to distribution system customers has increased each year since the recycled water facility commenced operations in April 2009; however, due to operational constraints, it is unlikely that the Facility will reach its design capacity of 4,000 acre-feet per year without additional storage on the distribution system. In its first year of operation, approximately 1,340 acre-feet of recycled water was produced and delivered (Figure 7.11). By 2012, the volume of recycled water delivered had jumped to roughly 2,340 acre-feet. While this is a significant improvement, it represents just over half of the 4,000 acre-feet of recycled water the Facility was designed to produce. With a goal of reducing coastal groundwater production, it is critical to the success of the project that the full 4,000 acre-feet per year be utilized to replace groundwater extractions.

Figure 7.11 Delivered Water Composition and Volume by Year



The capacity of the Facility to produce 4,000 acre-feet of recycled water has been limited by several factors including:

1. A lack of storage on the distribution system,
2. Insufficient nighttime demand to utilize the nighttime supplies,
3. Insufficient demand in the “shoulder” periods before and after the peak irrigation season, particularly March to mid-April and October to mid-November,
4. Pricing and convenience.

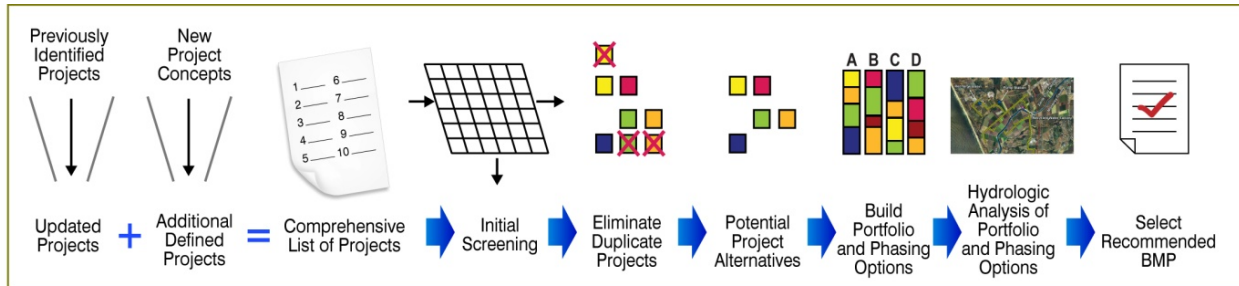
Currently, recycled water is not produced at night unless there is sufficient demand (water order) by a grower or group of growers. Water that has received secondary treatment is sent through the City of Watsonville’s ocean outfall when there is no demand for delivered water at night. It is critical to increase demand and deliveries during the irrigation season to fully utilize the 4,000 acre-feet per year available from the Facility. This project, Increased Recycled Water Storage, addresses Item 1 above, insufficient supplies during the daytime.

7.4.2 Project Development and Selection

Additional storage at the Water Recycling Facility was one of over forty potential projects proposed by stakeholders in the Pajaro Valley and vetted through a PVWMA Board appointed committee (2012 Draft Basin Management Plan Update) (Exhibit 7.16). The Ad Hoc Basin Management Plan Committee (Committee) was composed of twenty-one members including three PVWMA Directors and eighteen stakeholders representing a diverse sampling of the Valley. The stakeholders include representation from the local following groups: agriculture, municipalities, rural residents, environmentalists, etc. A team of consulting engineers was retained to look into each proposed project and identify strengths and weaknesses with respect to how well each project would work to solve the problems of the basin as well as the feasibility that the project could be constructed.

The Committee met regularly over an 18-month period to fulfill the Committee’s stated mission (noted above). The primary focus of the Committee over this time was to work with Agency staff and project consultants to identify, analyze, short-list, and ultimately recommend a portfolio of projects and programs to “solve” the Basin problem - i.e., halt overdraft and seawater intrusion. Figure 7.12 provides an overview of the Committee’s process of developing the BMP Update. At its June 8, 2012 meeting, the Committee endorsed a portfolio of BMP components the Committee believed provided the most appropriate balance between solving the basin problem and avoiding adverse impacts on the Agency’s budget (in turn avoiding or minimizing to the extent feasible impacts of the BMP Update on landowners’ pumping fees and delivery charges). On August 15, 2012 the PVWMA Board of Directors voted to approve the Committee’s recommended portfolio of BMP components, providing the basis for this draft 2012 BMP Update, which will be evaluated in the 2012 BMP Update EIR and provide the basis, during the BMP project financing phase, for the cost of service report, and ultimately the Prop 218 vote required to move implementation of the BMP Update forward.

Figure 7.12 Ad Hoc BMP Committee Process



Storage at the Water Recycling Facility was identified as a relatively low-cost project that would help to maximize the production of recycled water from the Facility by providing a temporary place for recycled water to be stored during times when the demand for delivered water was low, like at night for example. This project was selected over more costly and less feasible projects, such as the construction of a reservoir, deep aquifer injection of recycled water.

Approximately 2,000 AFY of recycled water supplies are not being used due in part to insufficient nighttime and shoulder period demand. Figure 7.13 shows a typical peak irrigation system recycled water demand and supply pattern. As the figure indicates, during the daytime the irrigation demand is greater than the supply. At night, the pattern is reversed, with the flow to the wastewater treatment plant typically well in excess of the irrigation demand. The increased storage project is estimated to deliver approximately 750 AFY, and the remaining 1,250 AFY of additional recycled water will need to be delivered at night and during the shoulder periods to fully utilize the 4,000 AFY available. The purpose of this project is to increase nighttime irrigation season recycled water deliveries by approximately 1,000 AFY and shoulder period recycled water deliveries by approximately 250 AFY, for a total of 1,250 AFY increased deliveries. A schematic of Increased Recycled Water Deliveries is shown in Figure 7.14.

Figure 7.13 Typical Summer Demand and Supply Pattern

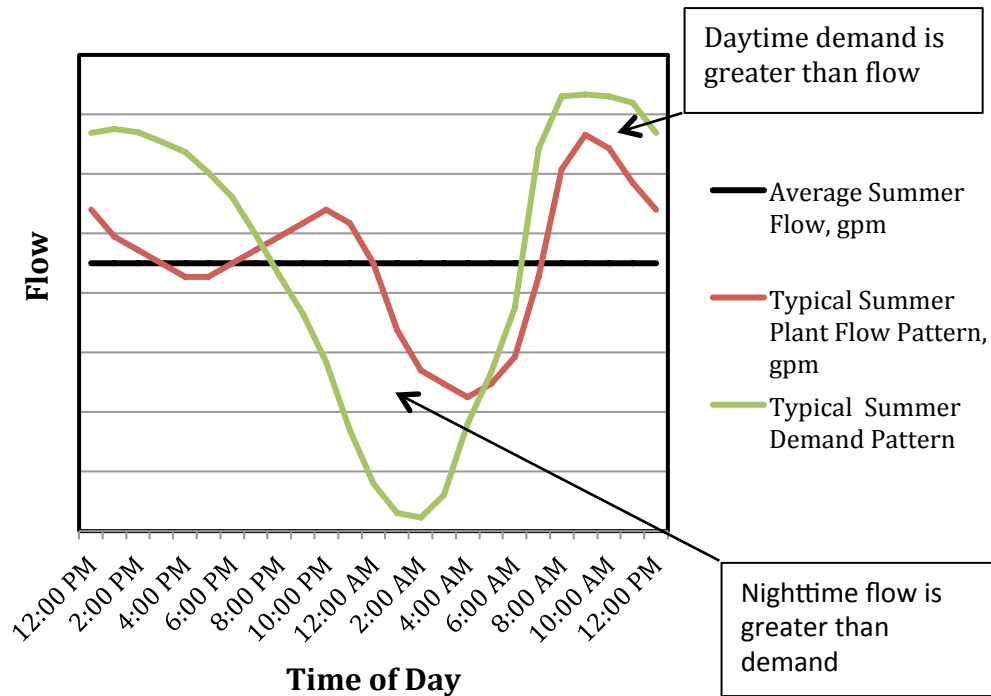
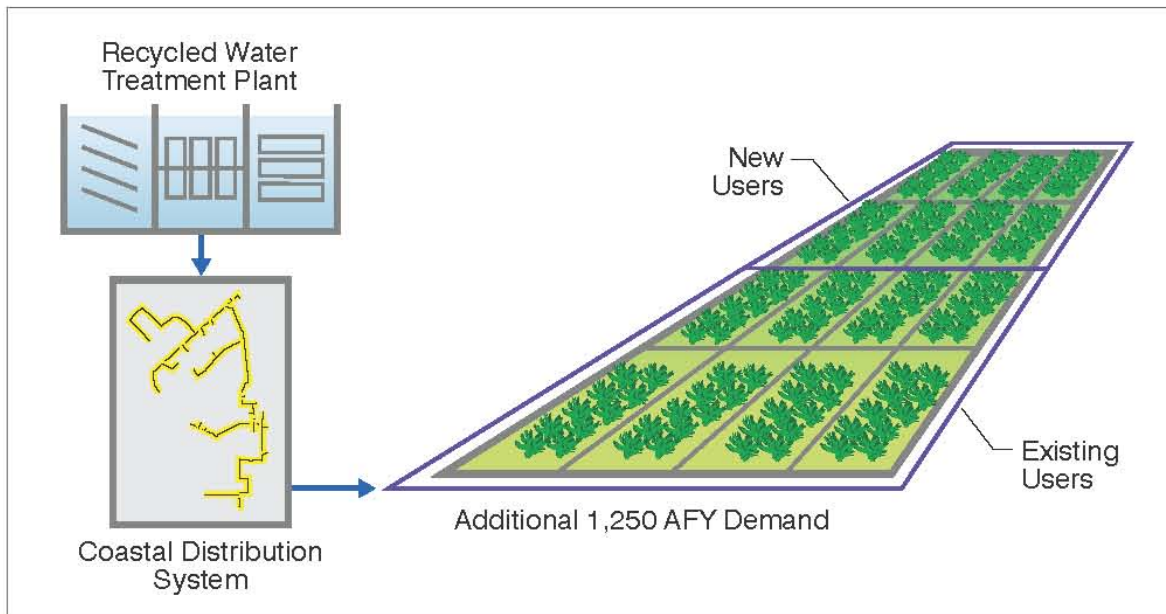


Figure 7.14 Increased Recycled Water Deliveries Project Schematic



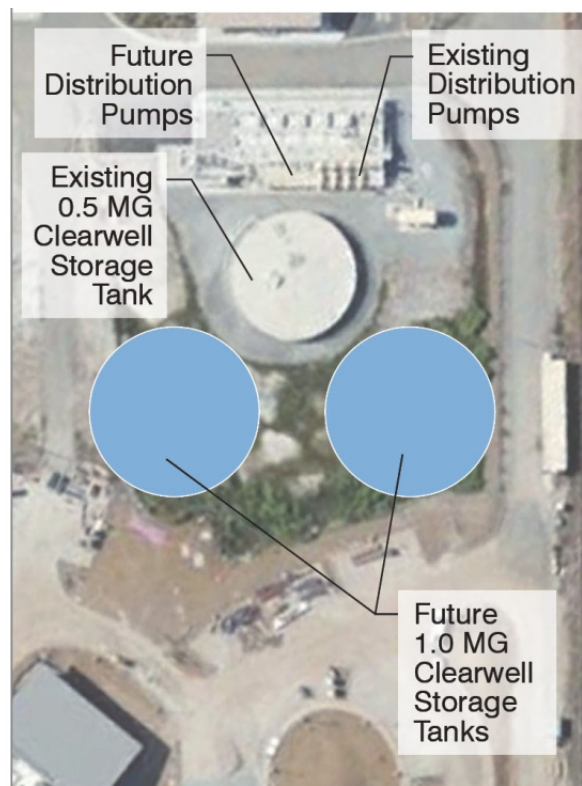
7.4.3 Project Description

To maximize the Water Recycling Facility to produce 4,000 AFY of recycled water, the Facility needs to be able to treat influent and produce recycled water 24 hours a day for approximately nine months out of the year. With inadequate demand on the distribution system at night, there is presently no beneficial use for recycled water that could be produced during that time. The most cost-effective way to maximize the capacity of the Facility is to treat and store recycled water during the night and deliver it the next day. This project was developed to provide that additional recycled water storage for daytime deliveries. The project elements include (Preliminary Design Meeting Notes, February 21, 2013) (Exhibit 7.17):

1. Storage Tanks. The proposed location of the storage tanks is shown in Figure 7.15. The bottom and top elevation of the tanks will match the existing 0.5 MG clearwell.
2. Distribution Pump Station. It is anticipated that two additional pumps will be added.

The Facility currently includes approximately one million gallons (MG) of water storage. Space is available south of the existing storage tank to add approximately two MG of storage. This project would add two one-million-gallon storage tanks at the treatment plant and additional pumps at the distribution pump station to allow more recycled water to be sent to the CDS during the daytime over the peak demand months (May through September). A preliminary drawing of the project is shown in Figure 7.16.

Figure 7.15 Treatment Plant Project Site



7.4.4 Project Physical Benefits and Measurement

The Increased Recycled Water Storage Project delivers the following physical benefits:

- **Water Supply Benefits:** Delivers 750 AFY of critical water supply.
- **Water Reliability Benefits:** Reduces groundwater pumping by an equivalent 750 AFY from the overdrafted Pajaro Groundwater Basin.

Two million gallons of additional storage is estimated to allow an additional 750 AFY of recycled water to be supplied to meet daytime demand in the CDS. The additional recycled water provides the Valley with a local, reliable, safe and drought proof irrigation supply and will offset groundwater pumping from the overdraft by an equivalent 750 AFY. The project yield benefits will continue to be measured and monitored by the exiting metering and monitoring systems in place at the treatment and distribution facilities.

The quality of delivered water is very well known. The PVWMA has a rigorous water quality monitoring program, tracking both the quality of each source water component contributing to delivered water, as well as the delivered water itself. Since 2009, staff has collected 353 water quality samples from the distribution system. Results of the monitoring effort are shown in Figure 7.17. In addition to monitoring conducted by the PVWMA, the Monterey County Department of Public Health has been retained to independently sample recycled water for bacteria.

Figure 7.17 Table of Delivered Water Quality

Laboratory results from Coastal Distribution System water samples collected from Turnouts between April 1st 2009 (following the beginning of recycled water production) and December 11, 2012.

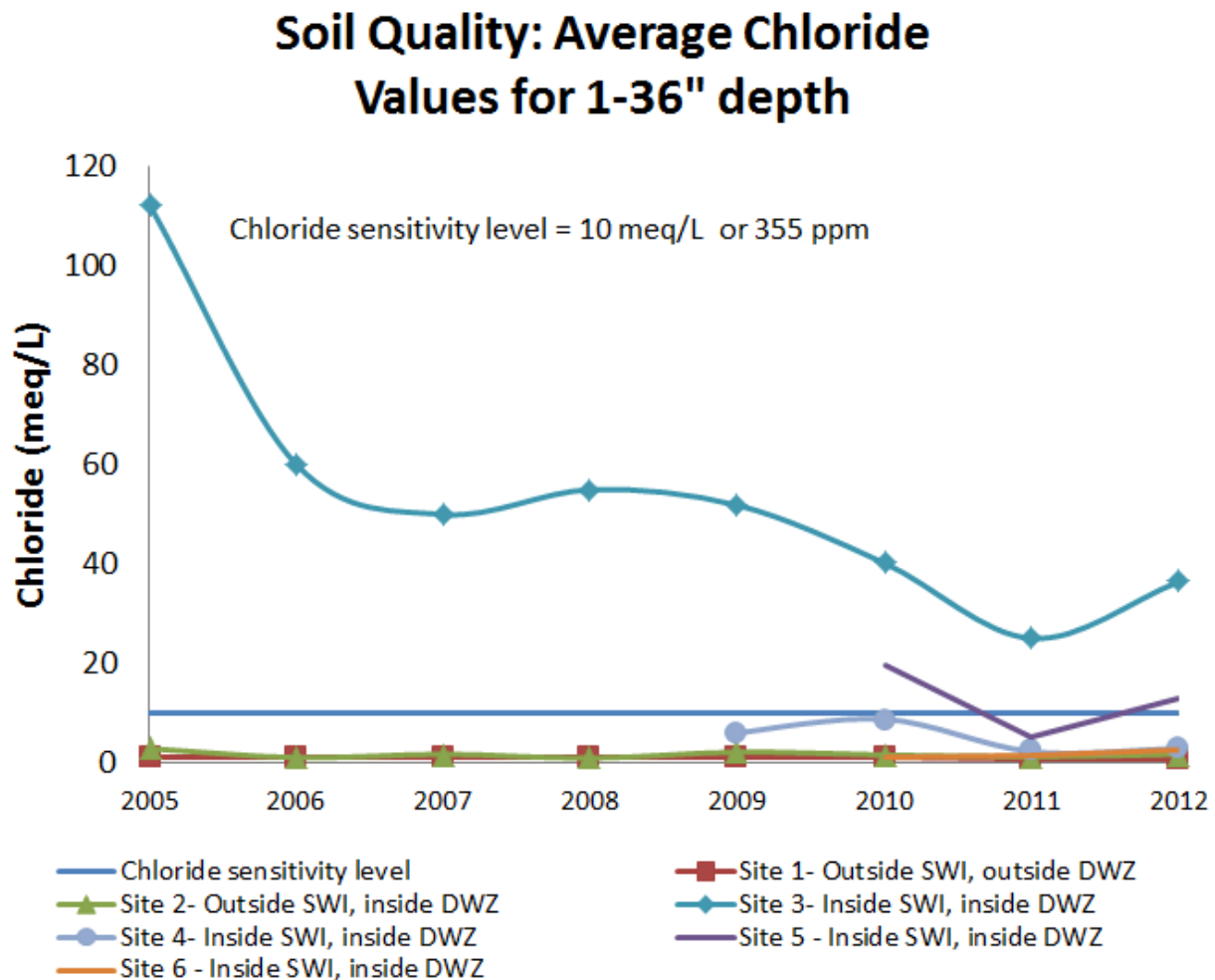
Season	Number of Samples Collected	Average of Chloride (mg/L)	Average of Nitrate as NO3 (mg/L)	Average of SAR (Sodium Adsorption Ratio)	Average of Sodium (mg/L)	Average of Specific Conductance (E.C.) (millimhos/cm)	Average of Total Diss. Solids (mg/L)
First Quarter 2009	Recycled Water Facility begins treating water for agricultural irrigation on March 27, 2009						
Second Quarter 2009	65	101	27	2.32	90	1.03	620
Third Quarter 2009	46	127	32	2.81	109	1.13	700
Fourth Quarter 2009	15	79	11	2.14	81	0.93	594
First Quarter 2010	3	48	11	1.33	47	0.65	422
Second Quarter 2010	24	88	23	2.26	85	0.93	526
Third Quarter 2010	25	94	12	2.73	99	0.97	559
Fourth Quarter 2010	7	122	25	2.94	110	1.19	665
First Quarter 2011	8	74	13	1.88	64	0.79	480
Second Quarter 2011	22	98	38	2.55	92	1.01	621
Third Quarter 2011	25	129	8	3.34	121	1.26	686
Fourth Quarter 2011	15	113	18	2.67	97	1.13	645
First Quarter 2012	13	95	51	2.39	82	0.92	555
Second Quarter 2012	38	87	28	2.30	82	0.98	578
Third Quarter 2012	33	103	15	2.60	93	1.09	592
Fourth Quarter 2012	14	136	19	3.02	108	1.20	662
Running Total & Averages	353	104	24	2.55	94	1.04	612

All samples are analyzed by an Environmental Laboratory Accreditation Program (ELAP) certified lab.

Soil Quality Monitoring

The PVWMA established a soil monitoring program in 2005 with the goal of documenting soil quality within the project area prior to recycled water deliveries as well as tracking changes to the soil quality through time. Sites are visited three times per year and soil samples are collected at 1-12", 12"-24" and 24"-36" below the ground surface. Improvements to the soil quality at some sites, especially those that had previously been irrigated by wells suffering from seawater intrusion, have been significant. Results from chloride monitoring are shown on Figure 17.18, below. CEQA review of the project has been completed and preliminary design is underway. The delivery of the project benefits are highly certain based on several years of project operations and monitoring.

Figure 7.18 Graph of Chloride Concentrations in Soil



SWI = Seawater Intrusion Zone
DWZ = Delivered Water Zone

7.4.5 Without Project Conditions and Annual Benefits

Without the additional storage tank at the Recycled Water Facility, the volume of recycled water produced, blended and delivered to distribution system customers will not reach its full capacity of 4,000 AFY. The supply has increased each year since the recycled water facility commenced operations in April 2009. In its first year of operation, approximately 1,340 acre-feet of recycled water was produced and delivered. By 2012, the volume of recycled water delivered had jumped to 2,340 acre-feet. While this is a significant improvement, it represents just over half of the 4,000 acre-feet of recycled water the Facility was designed to produce. With a goal of reducing coastal groundwater production, it is critical to the success of the project that the full 4,000 acre-feet per year be utilized to replace groundwater extractions. The additional storage will increase the project yield by 750 AFY. The primary water supply benefits for with and without project conditions are presented in the table below.

Annual Project Physical Benefits			
Project Name: Increased Recycled Water Storage			
Type of Benefit Claimed: Water Supply			
Measure of Benefit: acre-feet per year			
Additional Information about this Measure:			
	Physical Benefits		
Year	Without Project	With Project	Change Resulting from Project
2015	Current annual recycled water delivery of 2,340 AFY	Increased annual recycled water delivery of 3,090 AFY	750 AFY
2016	Same as above	Same as above	Same as above
2017	Same as above	Same as above	Same as above
2018	Same as above	Same as above	Same as above
Etc.	Same as above	Same as above	Same as above
Last year	Same as above	Same as above	Same as above
Comments: Improvements also allow groundwater pumping to be reduced by an equivalent 750 AFY, which helps balance the basin and stop seawater intrusion.			

7.4.6 Potential Adverse Effects

The project involves improving the facility to function at the original design capacity. Construction occurs within the existing treatment facility fenceline. There are no potential adverse effects.

7.5 Technical Justification Project 4 Pajaro Agricultural Water Quality and Aquifer Enhancement Project

Exceptionally fertile soil, high value crops and a climate that allows year-round production make the Pajaro Watershed unique in the California central coast. The region supports an \$800 million dollar annual agricultural industry. Unfortunately, this same productivity has led to adverse impacts on natural resources. The Pajaro Agricultural Water Quality and Aquifer Enhancement Project will address priority nutrient, sediment, and pesticide sources by supporting the implementation of aquifer recharge projects as well as agricultural water conservation and water quality improvement projects.

7.5.1 Project Need

Water is being withdrawn from the Pajaro Valley groundwater aquifer faster than it can be replenished resulting in depressed groundwater levels and coastal seawater intrusion according to the PVWMA Basin Management Plan (Exhibit 1.10). Further, nineteen waterbodies in the Pajaro River Watershed have been 303(d) listed by the USEPA for nitrate and sediment impairments for which agriculture has been listed as a source. To mitigate aquifer overdraft and water quality impairments in the region, there is a need to work with the agricultural community to implement management measures and build capacity to increase groundwater recharge and irrigation and nutrient efficiency.

To meet this need the Resource Conservation District of Santa Cruz County (RCDSCC) proposes the “Pajaro Agricultural Water Quality and Aquifer Enhancement Project” which includes the following components:

- Support the Community Water Dialogue to lead grower-based programs for improved water management
- Implement managed aquifer recharge (Lower Pajaro)
- Develop and implement cost-share and performance-based incentives for water quality and water supply
- Provide a Regional Mobile Lab to provide technical and outreach services to promote improved irrigation efficiency

The Project will address priority nutrient, sediment, and pesticide sources by supporting the implementation of aquifer recharge projects as well as agricultural water conservation and water quality improvement projects. Activities completed through the Pajaro Agricultural Water Quality and Aquifer Enhancement Project will support implementation of the TMDLs adopted or in progress, as shown in the following table.

The Project is anticipated to benefit the beneficial uses of water outlined in the CCRWQCB Basin Plan including municipal, agricultural, and industrial water supply, ground water recharge, support of rare, threatened or endangered species, migration and spawning of aquatic organisms, and preservation of wildlife habitat, biological habitats of special significance, as well as cold/warm freshwater habitat. The Project is consistent with the priorities of the RWQCB Basin Plan. Moreover, the proposed project will directly support TMDL implementation and Ag Order

compliance, by reducing the transport of pollutants and restoring water quality improvement functions to agricultural lands.

**The below table does not include pathogen TMDLs as that is not the primary focus of this project.*

	WATER BODY NAME	2010 303d Listing (TMDL status and/or expected completion date)
1	Beach Road Ditch	Nutrients, Sediment (2021)
2	Carnadero Creek	Nutrients, Sediment (2021)
3	Corralitos Creek	Sediment (2021)
4	Furlong Creek	Pesticides, Nutrients, Sediment (2021)
5	Harkins Slough	Nutrients (2021)
6	Llagas Creek (below Chesbro Reservoir)	Sediment (approved 2007), Salinity, Pesticides, Nutrients (2021)
7	McGowan Ditch	Nutrients (2021)
8	Millers Canal	Nutrients, Pesticides, Sediment (2021)
9	Pacheco Creek	Nutrients, Sediment (2021)
10	Pajaro River	Sediment (approved 2007), Nitrates (approved 2006), Pesticides (2013), Salinity (2021)
11	Pinto Lake	Nutrients (2013)
12	Rider Creek	Sediment (approved 2007),
13	Salsipuedes Creek (Santa Cruz County)	Nutrients, Sediment (2021)
14	San Benito River	Sediment (approved 2007), Salinity, Toxicity (2021)
15	San Juan Creek (San Benito County)	Nutrients, Sediment, Toxicity
16	Struve Slough	Nutrients(2021)
17	Tequisquita Slough	Nutrients, Sediments (2021)
18	Uvas Creek (above Uvas Reservoir)	Nutrients, Sediment (2021)
19	Watsonville Slough	Nutrients, Pesticides, Sediment (2021)

The following assessments/watershed plans document a need for the Pajaro Agricultural Water Quality and Aquifer Enhancement Project:

- PVWMA 2012 Basin Management Plan Update Draft (Exhibit 7.16)
 - Describes extent of aquifer overdraft, saltwater intrusion in coastal wells, impact of overdraft on sustainable water supply for the city of Watsonville, and \$800 million dollar agricultural industry that is dependent of the aquifer. The plan determined that there is a need to reduce groundwater pumping by 12,000 AFY and that 5,000 AFY could be accomplished through agricultural water conservation. Conservation savings are more cost-effective than development of supplemental supplies, with a comparative annual cost of \$200 per AF for conservation as compared to \$1,000-3,500/acre foot for supplemental supply projects.
- Pajaro River Watershed Integrated Regional Water Management Plan (2007)
 - Describes an analysis performed showing that recharge efforts are the most cost effective option for meeting future water supply shortages in the region when compared with recycled water and surface water treatment.
- Monterey Bay National Marine Sanctuary Final Management Plan (2008)
 - Describes the need for support for the development and implementation of economically feasible management improvements, and the development of incentives to support implementation of agricultural practices that improve water quality in the region and promote adoption of nonpoint source management practices.
- Central Coast Integrated Water Management Plan (2009)
 - Describes the impact of farming practices on the level of nutrient and toxicity water quality problems in the region and the need to implement irrigation and nutrient practices to reduce nonpoint source pollution into the surface waters.
- Lower Pajaro River Enhancement Plan (2002)
 - Describes the need for continued support and implementation of Mobile Irrigation Labs within the region to reduce the amount of fertilizer and water used to improve water quality and water supply.

7.5.2 Project Development and Selection

Varied project alternatives have been considered to address issues of agricultural water quality and water supply in the Pajaro River Watershed. Beginning in 2009, in addition to the efforts by local agencies, growers and landowners convened the Community Water Dialogue to address the water issues in the Pajaro Valley. The Community Water Dialogue provides a forum for a diverse and representative group of Pajaro Valley stakeholders, committed to a common vision, to be educated on the facts behind the water issue and the potential solutions, exchange ideas and leverage each other in order to spur individual and collaborative action within the community.

The stakeholders worked together to develop a set of recommendations/alternatives that would influence related water efforts to comprehensively and systematically address the imbalance of

water supply and demand while ensuring agricultural viability in the Pajaro Valley. Through this process the need for the Integrated Aquifer Enhancement Project was established.

In the 2012, through the Pajaro River Watershed IRWM Plan Update project solicitation and review process, the RCDSCC submitted a project application for the Integrated Aquifer Enhancement Project for the Pajaro Valley. That project proposed implementation of aquifer enhancement projects through:

- Storm water capture and returning of excess surface flows to the aquifer,
- Convening stakeholders to implement community-based water supply projects, and
- Incentive-based program for demand management.

Increasing groundwater recharge in the Pajaro Basin would help to reduce overdraft, thereby decreasing seawater intrusion occurring along the coast. Projects can also help to reduce nutrient and sediment flows to surface water systems, and improve hydrologic function in support of stream and wetland systems. The project received a high priority scoring based on the multiple IRWM objectives and priorities addressed by the project.

Also submitted in the 2012 Pajaro River Watershed IRWM Plan Update project solicitation and review process, was the Regional Mobile Lab. The Regional Mobile Lab was designed to provide technical services to farmers on a one-on-one basis, providing education and assistance to facilitate implementation of sound management practices and adaptive management by providing tools to protect water quality and improve water use efficiency. The project also received a high priority scoring based on the multiple IRWM objectives and priorities address by the project.

Due to the fact that both projects target the same stakeholders and offer similar approaches, the RWMG in coordination with the RCDSCC, integrated the projects to create one project, the Pajaro Agricultural Water Quality and Aquifer Enhancement Project. As an integrated project, it will provide not only the essential objectives of the plans above, but also takes a holistic approach to meeting the needs of both the agricultural community and the Pajaro Watershed.

7.5.3 Project Description

As described above the PVWMA BMP identified a need to reduce groundwater pumping by 12,000 AFY and of this amount, 5,000 AFY could be accomplished through agricultural water conservation. This Project is consistent with this goal, and of the 5,000 AFY of conservation needed, it is estimated that this Project can provide an estimate of approximately 200-400 AF of water conservation per year, as shown in the table below.

Furthermore, as described previously, this Project is consistent with the priorities of the RWQCB Basin Plan, and will directly support TMDL implementation and Ag Order compliance, by reducing the transport of pollutants and restoring water quality improvement functions to agricultural lands. Please see how individual Project components will contribute below.

Estimated Annual Water Conservation Savings Per Component (acre-feet)

Year	Community Water Dialogue	Managed Aquifer Recharge	Performance Based Incentives	Regional Irrigation Lab	Total
2014	60	0	50	90	200
2015	60	100	50	90	300
2016	60	200	50	90	400
Total Water Conservation Savings					900

The Pajaro Agricultural Water Quality and Aquifer Enhancement Project includes the following components:

- Community Water Dialogue: Is a forum of a diverse and representative group of Pajaro Valley stakeholders, committed to a common vision, to be educated on the facts behind the water issue and the potential solutions, exchange ideas and leverage each other in order to spur individual and collaborative action within the community. The Community Water Dialogue will engage growers in the process and guide recommendations to address water supply in the Pajaro Watershed.
 - Support and expand efforts of the community water dialog to inform and lead grower-based efforts for irrigation and nutrient management
 - Hold quarterly forums with growers and property owners to discuss overdraft solutions
 - Convene working group meetings to guide implementation of strategies
 - Communicate to stakeholders through website, email, etc.
 - Conduct surveys to gauge the extent to which Community Water Dialogue Programs have led to water conservation benefits
 - Estimated Water Conservation Savings (for example Wireless Irrigation Network): 60 AFY
- Managed aquifer recharge (Lower Pajaro): Is part of a systematic process of intentionally capturing and storing water in aquifers for later reuse and for the benefit of the environment. It is an important part of integrated water management that this project will be used to replenish depleted aquifers in the Lower Pajaro and to store water for later extraction and use.
 - Conduct percolation testing in potential recharge zones that have been mapped under prior efforts
 - Provide outreach to landowners
 - Design, permit, and implement 2 recharge basins
 - Monitor projects and quantify total increase in recharge

- Estimated Water Conservation Savings: 0 AF in 2014 (when recharge basins are being constructed), 100 AF in 2015 and 200 AF in 2016 and each year thereafter
- Cost-share and performance-based incentives for water quality and water supply: Will be provided to implement Best Management Practices (BMPs) on agricultural lands to reduce pollutant movement into surface and groundwater. In 2011, the RCDSCC and Driscoll's implemented a pilot project which developed an innovative model of public and private incentives that motivate growers to improve environmental performance. This project will build off of the performance-based incentive model by adopting standardized performance-based metrics, indicators and methods that are applicable to the Managed Aquifer Recharge and Regional Mobile Lab Programs. This will provide growers in each program with more flexibility in how they achieve program specific conservation goals, thereby encouraging innovation of more cost-effective methods of environmental stewardship tailored to their resource and management setting.
 - Identify successful strategies for performance based incentives that are relevant to the Managed Aquifer Recharge and Regional Mobile Lab Programs
 - Create public incentive structure with agencies for each program
 - Integrate performance based incentive structure into program operations
 - Estimated Water Conservation Savings: 50 AFY
 - Estimated Water Quality Benefit: We expect 1/3 of the growers participating to reduce their load reduction of nitrogen in stormwater by 10%
- Regional Mobile Lab: Is an educational and technical assistance program that is focused on working with agricultural producers to enhance irrigation and water management practices to improve system efficiency and reduce water use, runoff and nutrient loading.
 - Provide outreach to growers
 - Conduct distribution Uniformity, Pump efficiency tests, Nutrient monitoring and management evaluations, and data analysis, and assist with adaptive management of farming operations.
 - Provide education and training for irrigators and ranch managers
 - Estimated Water Conservation Savings: 90 acre feet per year

7.5.4 Project Physical Benefits and Measurement

- **Water Supply Benefit:** Water savings of up to 400 AFY.
- **Water Quality Benefit:** 10% load reduction in nitrogen in stormwater.

Groundwater supply and yield is considered to be the primary benefit of this Project as increased water supply is a benefit of all the components listed below, whereas water quality is secondary. Water quality will be improved by providing the agricultural community with technical assistance to improve their irrigation and nutrient management efficiency. These estimates were based on the following calculations.

- Community Water Dialogue will increase supply and reduce water demand as result of increased implementation of managed recharge projects and irrigation efficiency projects (water supply)
 - Estimated Water Conservation Savings: 60 AFY
 - It is estimated that participation in the Community Water Dialog will encourage growers in complimentary programs (Wireless Irrigation Network). We expect 20 growers participating per year, and each grower is expected to achieve a 10% improvement in water conservation. It is estimated that current water use from each grower in the region amounts to approximately 3 AFY. If on average these growers ranches are 10 acres then one would expect a minimum savings of approximately 60 AFY.
- Managed aquifer recharge (Lower Pajaro) (increased water supply):
 - Estimated Water Conservation Savings: 0 AF in the first year, 100 AF in the second year and 200 AF in the third year and each year thereafter
 - The RCDSCC will utilize the Recharge Initiative model, developed by UCSC, to quantify the water supply benefit of this project. This model builds off of data from a previous pilot project in the Lower Pajaro. Two recharge basins will be implemented. In the first year of the project, we anticipate implementing one recharge basin that will capture approximately 100 AF of water conservation savings in the second and third year and each year thereafter. In the second year of the project, we anticipate building a second recharge basin that will capture approximately 100 AF in the third year and each year thereafter. Estimated conservation savings are based on results seen during the pilot project and the experience of Dr. Andrew Fisher, UCSC.
- Cost-share and performance-based incentives for water quality and water supply (reduced demand and improved water quality)
 - Estimated Water Conservation Savings: 50 AFY
 - It is estimated that current water use from each grower in the region amounts to approximately 3 AF/acre. On average, we anticipate a 10% reduction in water use from each participating grower. The average ranch in the region is approximately 10 acres. Therefore, project implementation will result in an average water savings of 3 AFY per ranch. With approximately 16 ranches participating in the program per year, a minimum total of approximately 50 AF of water use will be reduced each year.
 - Estimated Load Reduction Calculation and Reference: 10 % reduction in concentration of nitrate.
 - It is estimated that of the growers participating in the incentives component 1/3 of the 50 growers, or 16 growers will reduce their nitrogen load reduction in stormwater by 10%.

- Regional Mobile Lab (reduced demand and improved water quality):
 - Estimated Water Conservation Savings: 90 AFY
 - We expect 10 growers participating per year, and each grower is expected to achieve a 10% improvement in water conservation. It is estimated that current water use from each grower in the region amounts to approximately 3 AF/acre per year. If on average these growers ranches are 10 acres then one would expect a minimum savings of approximately 90 AFY.

The following monitoring protocols will be used to verify project performance with respect to project benefits claimed:

- Community Water Dialog
 - Survey of community members to gage level of participation in Dialog and other project components and degree of management measure implementation
- Managed aquifer recharge (Lower Pajaro)
 - Number of projects implemented and amount of estimated annual recharge per project
 - Method to verify project performance: UCSC Aquifer Recharge Initiative monitoring program
- Cost-share and performance-based incentives for water quality and water supply
 - Number and type of projects implemented and projected results
 - Method to verify project performance: Performance based incentives monitoring framework (Exhibit 7.18)
- Regional Mobile Lab
 - Number of growers and acres served
 - Method to verify project performance (depending on practice implemented): EPA Region 5 Model, Nitrogen Index Model, DeNitrification-DeComposition (DNDC) Model, UCCE Crop Manage Tool, Agricultural Research Service (ARS) Model and the Water Quality Index (WQI) Model.

Uncertainty identified towards achieving primary and secondary benefits outlined above is the fact that it can be difficult to quantify benefits of community engagement and incentives. It is contingent upon existing conditions and grower motivation. Furthermore, it is not time or cost effective in most circumstances to gather in-field data related to water quality benefits provided by the project, as such, models are employed to quantify benefits and these models make assumptions regarding soil, climate, crop type, and practice effectiveness.

7.5.5 Without Project Conditions and Annual Benefits

Without this project, landowner management and operations would likely remain unchanged and agricultural impacts to water resources would continue. Additionally, the stormwater would not be capture or recharged to basin. These annual physical water supply and water quality benefits are presented in the tables below.

Annual Project Physical Benefits			
Project Name: Pajaro Agricultural Water Quality and Aquifer Enhancement Project			
Type of Benefit Claimed: Water Quality			
Measure of Benefit: Percent improvement of load reduction of nitrogen in stormwater			
Additional Information about this Measure: We anticipate 1/3 of growers participating in the RCDSCC Performance-based Incentives Project (being reported as match in the Pajaro Agricultural Water Quality and Aquifer Enhancement Project) reducing their load reduction of nitrogen in stormwater by 10%.			
	Physical Benefits		
Year	Without Project	With Project	Change Resulting from Project
2014-2033	Continued impaired water quality listed by the USEPA for nitrate and sediment impairments for which agriculture has been listed as a source.	Improved conservation outcomes, from the agricultural industry, for water quality in the Pajaro Valley.	Improved water quality, reduced need for treatment to meet regulatory criteria, benefits to aquatic ecosystems, reduced need for new, deeper wells to avoid nitrate contamination, and possibly human health benefits.
Comments: It is difficult to monetize the value of this water quality improvement, and this benefit is also being discussed qualitatively. Reduced nitrate concentrations benefits could include a reduced need for water quality source water improvement or treatment to meet regulatory criteria, benefits to aquatic ecosystems, reduced need for new, deeper wells to avoid nitrate contamination, and possibly human health benefits. During this project, working under the performance-based incentives component, we will establish the baseline water quality value and work with growers to improve and quantify their individual water quality benefit as a result of participation in performance-based incentives.			

Annual Project Physical Benefits			
Project Name: Pajaro Agricultural Water Quality and Aquifer Enhancement Project			
Type of Benefit Claimed: Total Project Water Conservation Savings			
Measure of Benefit: acre-feet per year			
Additional Information about this Measure: Based on projected annual water conservation savings associated with this project we anticipate 400 acre feet per year of water conservation savings in 2016 and each year thereafter.			
	Physical Benefits		
Year	Without Project	With Project	Change Resulting from Project
2014	0	200 AFY	400 AFY
2015	0	300 AFY	400 AFY
2016	0	400 AFY	400 AFY
2017	0	400 AFY	400 AFY
2018	0	400 AFY	400 AFY
2019	0	400 AFY	400 AFY
2020	0	400 AFY	400 AFY
2021	0	400 AFY	400 AFY
2022	0	400 AFY	400 AFY
2023	0	400 AFY	400 AFY
2024	0	400 AFY	400 AFY
2025	0	400 AFY	400 AFY
2026	0	400 AFY	400 AFY
2027	0	400 AFY	400 AFY
2028	0	400 AFY	400 AFY
2029	0	400 AFY	400 AFY
2030	0	400 AFY	400 AFY
2031	0	400 AFY	400 AFY
2032	0	400 AFY	400 AFY
2033	0	400 AFY	400 AFY
Last Year of Project Life	0	400 AFY	400 AFY
Comments: This project will result in an estimated reduction of 200AFY of water being pumped from the basin (through Community Water Dialogue, Performance Based Incentives and the Regional Irrigation Lab), and Managed Recharge will contribute an estimated additional 200AFY, for a total benefit to the basin of 400 AFY after year 2015. The project will begin in 2014 with marginal increase in benefits each year to total ongoing benefit of 400 acre-feet of water conservation savings per year. A conservative estimated useful life of the project is twenty years.			

7.5.6 Potential Adverse Physical Effects

Although activities required to construct aquifer recharge basins may have temporary adverse physical effects from construction, we will be adhering to all permitting and regulatory requirements. Some agricultural land will be taken out of production. We anticipate realized long-term environmental benefits significantly outweighing any short-term adverse effects.